Vol. 893 Number 1

OFFICIAL GAZETTE

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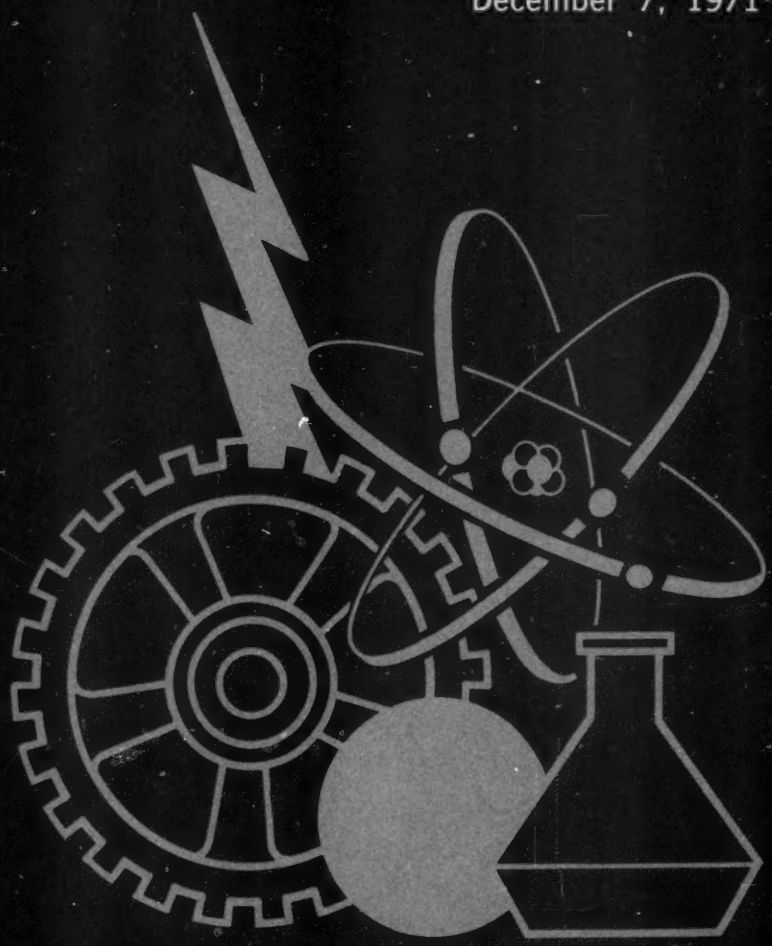
PATENTS

December 7, 1971



U. S. DEPARTMENT OF COMMERCE
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OFFICIAL GAZETTE of the UNITED STATES PATENT OFFICE

December 7, 1971 Volume 893 Number 1

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PATENT OFFICE NOTICES

PATENTS AND TRADEMARKS

Relief in Cases Affected by the Postal Emergency of March 1970

On June 30, 1971, President Nixon signed into law Public Law 92–34.

Public Law 92–34 requires claims for the benefit of an earlier filing date (Section 1.) and requests for such other relief as may be appropriate (Sec. 2.) to be filed in the Patent Office within 6 months after enactment, that is by December 30, 1971. Failure to file a statement within the noted period will result in loss of right to take advantage of the benefits of the law. Further explanation or evidence may be required at a subsequent time. Public Law 92–34 provides relief only for situations caused by the postal emergency which began on March 18, 1970, and ended on or about March 30, 1970, and for which there is no remedy under existing law.

The following explanation is designed to serve as a guide for persons desiring relief under the law.

The verified statement required to be filed under sections 1 and 2 of the law may be by any of the following:

(a) Applicant(s) for patent or trademark registration;
(b) Patentee(s) or trademark registrant;
(c) Owner(s) of record.

In cases involving plural inventors, statements made under (a) or (b) must be signed by all inventors.

The verified statement must specify the particular earlier date of receipt in the Patent Office to which the applicant, patentee or trademark registrant, or owner of record believes his application, fee or other paper would be entitled except for the delay caused by the postal emergency of March, 1970. The statement must be verified, that is, in the form of an oath or declaration. (37 CFR 1.68 (Patent Rule 68) and 2.20 (Trademark Rule 2.20).)

Evidence will not normally be required or considered by the Patent Office regarding a claimed filing date of March 18, 1970, or later, in applications actually filed before June 1, 1970. Claims for earlier filing dates in cases actually filed after June 1, 1970, or claiming a date prior to March 18, 1970, will be considered prima facie unreasonable unless an acceptable explanation of the basis for the claim is filed in the Patent Office with the claim or within 1 month or such longer time as may be prescribed by the Commissioner. Any claim not accepted by the Patent Office because it is obviously defective on its face or unreasonable may be subjected to further review by petition to the Commissioner.

The statement should adequately identify the involved application, patent, or trademark registration by including the name of the applicant, patentee or registrant, title of the invention or an identification of the mark, serial number, filing date, group art unit number and any other identifying data such as status of the case (e.g., awaiting first action, amendment, brief, etc.). Acceptable statements will be acknowledged, made of record and retained in the Patent Office files.

When practical, earlier filing dates accorded under this law, as well as the originally granted filing dates, will be identified on ensuing patents and trademark registrations. These dates will also be included in the OFFICIAL GAZETTE in connection with patents, trademark registrations and trademarks published for opposition. In other cases, such as applications in issue prior to filing of a claim, the patent or trademark registration number and claimed filing dates will be published in the OFFICIAL GAZETTE after December 30, 1971.

Patents issued with earlier filing dates afforded by this law will not be effective as prior art as of such earlier filing dates under subsection 102(e) of title 35 of the United States Code.

In a pending patent application in which a claim for an earlier filing date has been acknowledged under this law, applicants need not file a Rule 131 affidavit to overcome a reference having an effective filing date between the "earlier" and the actual filing date of the application. Intervening references of this type will be cited but not applied by the examiner. Although a statement claiming an earlier date is accepted by the Patent Office, the claimed earlier date may be called into question in subsequent inter partes proceeding in the Patent Office or in the courts. In these proceedings, the applicant or owner may be required to present further evidence establishing the filing date to which the application is entitled. In such cases a definite determination shall be made as to whether the applicant is entitled to the earlier date under the law.

In cases where a patent application or an application for registration or late renewal of a trademark is determined to have become abandoned for failure to meet a statutory time limit because of the postal emergency, the application will automatically be restored to pending status by the acceptance of the request, and prosecution or other processing of the application will be resumed. Similarly, if a trademark registration is determined to have been cancelled for failure to meet the statuory time limit within which to file the affidavit required under section 8 of the Trademark Act (15 U.S.C. 1058a) because of the said emergency, the order for cancellation will be rescinded.

As explained in the notice of January 26, 1971 (882 O.G. 1342), applicants who may be entitled to earlier filing dates should note that a change in their U.S. filing date might, in turn, alter the date of expiration of the 6- and 12-month periods for filing applications abroad under provisions of the Paris Convention for the Protection of Industrial Property.

WILLIAM E. SCHUYLER, JR.,
Commissioner of Patents.

Dated: July 14, 1971.

JAMES H. WAKELIN, JR.,
Assistant Secretary for Science and Technology.

[FR Doc. 71–10469; Filed 7–22–71; 8:52 am]

36 F.R. 13694; July 23, 1971

ABBREVIATED FIRST ACTION TRIAL PROGRAM

Request for Comments

The Abbreviated First Action Program, announced in the OFFICIAL GAZETTE of February 2, 1971 (883 O.G. 2), using form PO–1142 has been in operation for over nine months. Considerable experience with the use of this form should now be available throughout the patent profession. It is recognized that though the use of this form may not be an ideal form of communication, the increased burdens on the examination and processing of patent applications have necessitated the development of more efficient methods of expediting the prosecution.

Comments, criticisms, and suggestions concerning the Abbreviated First Action Program are invited. It is requested that the opinions expressed be made in the light of current conditions under which the Office must operate and be based on actual experience with the program. In order to adequately determine the quality and value of this program all views, both favorable and unfavorable, are earnestly solicited. Any critical comments should be supported wherever practical by reference to specific cases.

Letters written in response to this request should be sent as soon as possible to the Commissioner of Patents, Washington, D.C. 20231, Attn: Assistant Commissioner R. A. Wahl.

FRANK H. BRONAUGH,
Nov. 10, 1971. *Deputy Assistant Commissioner.*

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,817,195, L. P. Curtin, CLEANING METAL SURFACES; 2,846,342, same, BONDING COATS FOR METAL; 2,901,385, same, MICRO-CRYSTALLINE BONDING COATS FOR METAL, filed Feb. 4, 1969, D.C.N.J. (Newark) Doc. 125–69, *Robert E. Gaynor and Joseph Stevens* v. *Diamond Alkali Company and Diamond Shamrock Corp.* Stipulation and order of dismissal, June 24, 1971.

2,829,877, G. C. Davis, Jr., REFRACTORY; **2,915,893,** E. D. Wilkins, METAL CLAD REFRACTORY BRICK, **filed** May 4, 1971, D.C., C.D. Calif. (Los Angeles), Doc. 71–1087–JWC, *Kaiser Aluminum & Chemical Corp.* v. *International Minerals & Chemical Corp. and Interpace Corp.*

2,846,342. (See 2,817,195.)

2,896,857, G. R. Tompkins, WASHING APPARATUS, **filed** Sept. 30, 1968, D.C., N.D. Tex. (Lubbock), Doc. CA–5–535, *Malsbary Manufacturing Company et al.* v. *Orbit Car-Wash, Inc. et al.* Consent judgment, patent valid and defendants permanently enjoined, Jan. 14, 1971.

2,901,385. (See 2,817,195.)

2,915,893. (See 2,829,877.)

2,920,977, B. F. Adams, CELLULAR SURFACE COVERINGS HAVING AN EMBOSSED APPEARANCE, **filed** May 11, 1971, D.C.N.J. (Camden), Doc. C–673–71, *Armstrong Cork Company* v. *Mannington Mills, Inc.*

3,119,501, J. H. Lemelson, AUTOMATIC WAREHOUSING SYSTEM; **3,139,994,** A. R. Chasar, MECHANICAL LOAD HANDLING TRANSFER AND STORAGE EQUIPMENT, **filed** Dec. 1, 1964, D.C., W.D.N.Y. (Buffalo), Doc. C–11–210, *The Triax Company* v. *Hartman Metals Fabricators, Inc.* Decision dismissing Plaintiff's Complaint, June 16, 1971.

3,139,994. (See 3,119,501.)

3,146,290, D. M. Park, ELECTRONIC MUSIC CIRCUIT; **3,383,452,** Park and Campbell, MUSICAL INSTRUMENT; **Re. 26,521,** D. M. Park, AUTOMATIC REPETITIVE RHYTHM INSTRUMENT TIMING CIRCUITRY, **filed** May 23, 1969, D.C., N.D. Ill. (Chicago), Doc. 69c1122, *The Seeburg Corporation of Delaware* v. *Lyon & Healy, Inc.* Order cause removed from the active calendar with leave to reinstate before June 4, 1971. By agreement, it is ordered that ruling on pending motions is deferred, Mar. 5, 1971.

3,173,165, P. L. Speight, APPARATUS FOR APPLYING DETERGENT TO RUGS AND THE LIKE. **filed** May 28, 1971, D.C., S.D. Ohio (Columbus), Doc. 71–136, *Ballantyne Manufacturing Company* v. *Federated Department Stores, Inc.*

3,262,378. (See 3,453,939.)

3,266,477, A. B. Silles, SELF-CLEANING COOKING APPARATUS, **filed** May 20, 1970, D.C., E.D. Tenn. (Chattanooga), Doc. 5904, *E. I. du Pont de Nemours & Company* v. *Magic Chef, SCM, and Raider.* Issues compromised by parties and settled out of court, Feb. 8, 1971.

3,325,097, A. Slutsky, TAXI METERS AND A CONTROL SYSTEM FOR TAXI METERS, **filed** June 24, 1971, D.C., S.D.N.Y., Doc. 71–C–2811, *Abraham Slutsky* v. *Efficient Instruments Corp.*

3,337,673, N.C. Jeckel, UNIFORMLY CORRUGATED PROSTHESIS AND PROCESS OF MAKING SAME, **filed** June 2, 1969, D.C.N.J. (Newark), Doc. 622–69, *United States Catheter & Instrument Corp.* v. *Meadox Medical, Incorporated.* Consent judgment for permanent injunction, June 30, 1971.

3,370,223, A. Senetcen, AUTOMATIC VOLTAGE REGULATOR, **filed** June 22, 1971, D.C.N.H. (Concord), Doc. 3353, *The Superior Electric Company* v. *Raytheon Company.*

3,372,493, L. Birch, ANTIQUED PAINTING ON WOOD AND BY-THE-NUMBER SYSTEM OF MAKING THE SAME, **filed** Mar. 12, 1968, D.C., S.D.N.Y., Doc. 68–C–1048, *Avalon Manuacturing Corp.* v. *Friends Industries, Inc.* Stipulation and order of dismissal, June 28, 1971.

3,377,770, D. R. Rorer, SKIN-PACKAGING APPARATUS, **filed** Mar. 5, 1969, D.C., N.D. Ohio (Cleveland), Doc. C69–169, *American Packaging Corp.* v. *Stone Container Corporation.* Consent order, complaint and counterclaims dismissed, July 23, 1971.

3,383,452. (See 3,146,290.)

3,397,260, B. A. Lamberton, METHOD FOR ENCASING RIGID MEMBERS WITH CONCRETE, **filed** July 20, 1971, D.C., N.D. Calif. (Los Angeles), Doc. 71–1385, *Construction Techniques, Inc. et al.* v. *Tri-Way Contractors, Inc. et al.*

3,424,479, Ditson and Cantrel, COUPLING AND ROD SYSTEM FOR ROCK DRILLS, **filed** July 9, 1971, D.C., S.D. Fla. (Miami), Doc. 71–1074–C–PF, *Ingersoll-Rand Co., etc.* v. *Brunner & Lay, Inc., etc.*

3,425,435, R. Garabello, ROTARY OSCILLATING PISTON PUMP ADDITIVE INJECTION DEVICE FOR FLUID DELIVERY SYSTEM, **filed** July 6, 1971, D.C.N.J. (Newark), Doc. 992–71, *Metropolitan Petroleum Petrochemicals Co., Inc.* v. *Aetna Chemical Corp.*

3,437,059, Stonier and James, DECORATIVE POLE ASSEMBLY, **filed** July 14, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1720, *Russ Stonier, Inc.* v. *Allied National Products, Inc.*

3,453,939, Pollitz, Schrimper and Fairchild, BITUMINOUS PAVER; **3,262,378,** Schrimper and Page, ADJUSTABLE STRIKE-OFF PLATE FOR FINISHING MACHINES, **filed** May 20, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1233, *Iowa Mfg. Co. of Cedar Rapids* v. *Barber-Greene Co.* **Same, filed** July 14, 1971, D.C., E.D. Ill. (Danville), Doc. CV 71–124–D, *Iowa Manufacturing Company of Cedar Rapids* v. *Blaw-Knox Construction Equipment Inc.*

3,459,302, D. S. Ross, APPARATUS AND METHOD OF FILTERING SOLIDS FROM A LIQUID EFFLUENT, **filed** June 28, 1971, D.C., S.D. Ohio (Cincinnati), Doc. 8031, *Hydro-Clear Corporation* v. *Pollution Control, Inc.*

3,476,143, R. L. Kaster, PIVOTING DISC HEART VALVE, **filed** Dec. 1, 1970, D.C., C.D. Calif. (Los Angeles), Doc. 70–2693–F, *Washington Scientific Industries, Inc. and The Regents of the University of Minnesota* v. *Shiley Laboratories, Inc.*

3,517,390, L. Whitehead, HIGH POWER ACOUSTIC RADIATOR, **filed** Feb. 16, 1971, D.C., E.D. La. (New Orleans), Doc. CA 71–452, *Layne Whitehead* v. *Shell Oil Company.*

3,535,407, J. W. Pike, METHOD OF AUTOCLAVING BUILDING BLOCKS, **filed** Feb. 20, 1967, D.C., W.D.N.Y. (Buffalo), Doc. C–1967–76, *Struthers Scientific and International Corporation* v. *John A. Lo Buglio, doing business as Lo Buglio Block Company.* (Amended complaint, July 16, 1971.)

3,536,144, Hood and Osburn, ARTICULATED WHEELED FRAME FOR AGRICULTURAL IMPLEMENTS, **filed** July 15, 1971, D.C., W.D. Okla. (Oklahoma City), Doc. 71–446–C, *Blackwell Steel Products, Inc.* v. *Medford Steel Products, Inc.*

3,540,229, P. H. Bunten, AIR COOLING APPARATUS, **filed** July 27, 1971, D.C., S.D. Fla. (Miami), Doc. 71–1154–C–TC, *Paul H. Bunten et al.* v. *Weathermatic Corp.*

3,553,691, J. W. Lassiter, LONG RANGE POSITION DETERMINATION SYSTEM, **filed** July 12, 1971, D.C., S.D. Tex. (Houston), Doc. 71–H–765, *James W. Lassiter, Lab Navigation Co., Navigation Management, Inc.* v. *Decca Survey Systems, Inc. et al.*

3,556,391, D. W. Kosterka, PHONOGRAPH RECORD ALBUM PACKAGE, **filed** Jan. 19, 1971, D.C., S.D.N.Y., Doc. 71–C–2816, *Album Graphics, Inc. etc.* v. *Ivy Hill Lithograph Corp.*

3,574,391, S. D. Doboze, VEHICLE GATE HINGE CONSTRUCTION, **filed** July 14, 1971, D.C., N.D. Ohio (Cleveland), Doc. C71–695, *Scranton Truck Body Equipment Co.* v. *Stephen D. Doboze and J. J. Turner, Inc.*

Re. 25,626, Yeo and Waid, AIR-HEATING GAS BURNER, **filed** Jan. 23, 1968, D.C., N.D. Ill. (Chicago), Doc. 68c132, *Maxon Premix Burner Company, Inc.* v. *Eclipse Fuel Engineering Company and Morrill and Loeller, Inc.* Judgment, plaintiff owner of patent and is infringed, July 2, 1971.

Re. 26,580, J. A. Currier, METHODS AND MACHINES FOR STOCKING PRODUCTION; **Re. 26,581,** same KNITTED PRODUCTS, **filed** July 9, 1971, D.C., M.D.N.C. (Greensboro), Doc. C–154–G–71, *Scott & Williams, Inc.* v. *Billi America, Inc. et al.*

Re. 26,521. (See 3,146,290.)

Re. 26,581. (See Re. 26,580.)

Re. 26,724, R. L. Paquin, REFRIGERATED TUMBLER, **filed** July 2, 1971, D.C., N.D. Ill. (Chicago), Doc. 71c1583, *Glacier Ware, Inc.* v. *Jet-X-Corp and Goldblatt Bros.*

Re. 26,871, Morkoski, Clendenin and Corwith, MATERIAL CHOPPING AND COMMINUTING DEVICE, **filed** July 14, 1971, D.C., E.D. Wis. (Milwaukee), Doc. 71–C–365, *International Harvester Company* v. *Gehl Company.*

Re. 26,977, J. P. Pereira, SWIMMING POOL CONSTRUCTION, **filed** June 29, 1971, D.C.R.I. (Providence), Doc. 4653, *Weatherking Products, Inc.* v. *Hallmark Pools of New England, Inc.*

Certificates of Correction for the Week of Dec. 7, 1971

3,317,379	3,571,680	3,580,354	3,585,690
3,380,933	3,571,766	3,580,966	3,585,744
3,471,895	3,571,862	3,580,987	3,586,052
3,505,319	3,572,037	3,581,169	3,586,073
3,515,081	3,572,318	3,581,277	3,587,082
3,522,416	3,572,811	3,581,535	3,587,178
3,529,396	3,573,268	3,581,830	3,587,593
3,531,348	3,573,384	3,581,983	3,588,047
3,533,942	3,573,570	3,582,148	3,588,446
3,544,322	3,573,784	3,582,751	3,588,604
3,545,512	3,573,807	3,582,904	3,589,339
3,548,049	3,573,900	3,582,933	3,589,788
3,549,342	3,574,347	3,583,128	3,590,786
3,549,435	3,574,539	3,583,157	3,591,645
3,551,422	3,574,816	3,583,319	3,591,753
3,555,350	3,575,441	3,583,354	3,592,048
3,557,177	3,576,271	3,583,359	3,592,722
3,558,274	3,576,538	3,583,789	3,592,752
3,558,761	3,576,928	3,583,882	3,592,770
3,560,149	3,576,979	3,584,207	3,592,901
3,562,644	3,577,271	3,584,450	3,592,906
3,563,025	3,577,385	3,584,483	3,593,128
3,563,510	3,577,587	3,584,652	3,594,117
3,565,241	3,578,310	3,584,671	3,594,142
3,566,075	3,579,224	3,585,057	3,594,395
3,567,017	3,579,443	3,585,290	3,595,890
3,567,737	3,579,460	3,585,492	
3,569,920	3,579,636	3,585,515	
3,571,635	3,579,761	3,585,645	

Patents Available for Licensing or Sale

D. 218,959. WATER SKI ROPE HOLDER. Kenneth L. Hess, 6763 Ferrier Court, Sacramento, Calif., 95822.

3,225,761. FATIGUE SUPPORT. Robert Swensen, 120 Poincianna Drive, Martinez, Ga., 30907.

3,286,749. FASTENER TOOL WITH FASTENER ENGAGING MEANS. Howard K. Learned, 3825 N. Hillside, Wichita, Kans., 67219.

3,455,301. MALE GENITAL APPLIANCE. Bruce P. Clark, 133 17th St., Oakland, Calif., 94612.

3,577,580. SELF-CLEANABLE HAIRBRUSH. Robert B. Rand, P.O. Box 2461, Charleston, W. Va.

3,586,053. SINGLE CONTROL FAUCET. Ernest C. Browning, 2383 Zollinger Road, Columbus, Ohio., 43221.

3,588,815. TIRE PRESSURE WARNING DEVICE. Mrs. Clyde Koonce, 803 W. 67th St., Odessa, Tex., 79760.

3,595,248. CLEANSING DEVICE. Earl Wright, Creative Products, Inc., P.O. Box 51, Decatur, Ill., 62525.

3,605,744. INJECTION APPARATUS AND METHOD OF INJECTING. Edward M. Dwyer, 56 Church St., Plymouth, Pa., 18651.

3,606,141. VISUAL SIGNAL FOR RURAL MAILBOXES. Floyd R. Taylor, 3346½ Walnut Ave., Carmichael, Calif., 95608.

3,618,279. BUILDING BLOCK. True F. Sease, R.R. 3, Airhill Road, Brookville, Ohio, 45309.

The following 2 patents are offered by: O. C. Forehand, 104 E. Pope St., Box 428, Sylvester, Ga., 31791.

3,249,325. MISSILE GUIDANCE SYSTEM.

3,597,840. SAFETY RAZOR.

General Motors Corporation is prepared to grant non-exclusive license under the following patent upon reasonable terms.

Application for license may be addressed to the Director, Patent Section, General Motors Bldg., 3044 W. Grant Blvd., Detroit, Mich., 48202.

3,466,737. BRAZING OF TITANIUM.

The following 4 patents are offered by the Kennecott Copper Corporation.

Inquiries concerning licenses for the patents may be addressed to: Lowell H. McCarter, Ledgemont Laboratory, Kennecott Copper Corp., 128 Spring St., Lexington, Mass., 02173.

3,504,178. METHOD AND APPARATUS FOR CRYSTALLOGRAPHIC ORIENTATION AND MEASUREMENT.

3,588,933. METHOD AND APPARATUS FOR SIMULTANEOUSLY UPSET FORMING BOTH ENDS OF A DUCTILE MATERIAL ROD BLANK OR THE LIKE.

3,610,204. APPARATUS FOR ACCRETING MOLTEN COPPER ON A MOVING CORE MEMBER.

3,616,340. REFINING OF LIQUID COPPER.

General Electric Company is prepared to grant non-exclusive licenses under the following 42 patents upon reasonable terms to domestic manufacturers.

Applications for license under the following 2 patents may be addressed to: Patent Counsel, Visual Communication Products Operation, General Electric Company, Waynesboro, Va., 22980.

3,586,764. T.V. CAMERA SYSTEM EMPLOYING A LUMINANCE PICKUP TUBE AND A COLOR PICKUP TUBE FOR MULTIPLEXED RED AND BLUE SIGNALS.

3,590,207. METHOD OF JOINING WIRES OF DIFFERENT DIAMETERS.

Applications for licensing under the following 4 patents may be addressed to: General Electric Company, Ordnance Department, 100 Plastics Ave., Pittsfield, Mass., 01201. Attention: J. F. McDevitt, Patent Counsel.

3,156,539. SUPERCONDUCTIVE MATERIALS.

3,165,403. SUPERCONDUCTIVE MATERIALS.

3,169,859. SUPERCONDUCTIVE MATERIALS.

3,291,758. SUPERCONDUCTIVE MATERIALS.

Applications for license under the following 16 patents may be addressed to: Patent Counsel, Major Appliance Business Group, General Electric Company, Appliance Park, Louisville, Ky., 40225.

3,364,588. CLOTHES TREATING MACHINE WITH AUTOMATIC UNLOADING MEANS.

3,373,501. PROCESS OF DRYING FABRICS IN A ROTATABLE RECEPTACLE.

3,381,389. DRYER CONTROL.

3,394,466. ELECTRONIC DRYNESS CONTROL.

3,430,223. SIGNAL MEANS FOR AUTOMATIC WASHING MACHINE CONTROLLED BY TIMER DEVICE.

3,464,225. ELECTRONIC TEMPERATURE REGULATION SYSTEM USING SOLID STATE DEVICES AND POINT CONTACT SENSORS.

3,466,902. FLUID NOZZLE.

3,487,345. ELECTRONIC TEMPERATURE REGULATION SYSTEM USING SOLID STATE DEVICES AND POINT CONTACT SENSORS.

3,534,306. SOLID STATE TEMPERATURE SENSOR.

3,537,475. VALVE ASSEMBLY.

3,568,789. NOISE BAFFLING METHOD AND APPARATUS FOR A WASHING APPLIANCE.

3,590,605. SIGNAL AND CONTROL FOR WASHING MACHINES.

3,594,058. RACK ASSEMBLY FOR FRONT-LOADING DISH-WASHER.

3,595,028. CONTROL MEANS FOR AIR-CONDITIONING SYSTEM.

3,596,834. SELF-REVERSING SPRAY ARM ASSEMBLY FOR A WASHING APPLIANCE.

3,600,902. ADJUSTABLE AGITATOR FOR FABRIC CLEANING MACHINES.

Applications for license under the following 22 patents may be addressed to: Patent Counsel, Transportation Systems Business Division, General Electric Company, Legal Department, Bldg. 20–2, 2901 E. Lake Road, Erie, Pa., 16501.

3,450,873. RAIL VEHICLE DETECTION SYSTEM.

3,450,874. RAILWAY TRACK CIRCUIT.

3,450,875. RAIL VEHICLE CONTROL SYSTEM.

3,450,943. OVERSPEED CHECKING CIRCUIT.

3,450,944. INTEGRITY CHECKING CIRCUIT FOR TRAIN CONTROL SYSTEM.

3,457,487. STATIC FIELD SHUNT CONTACTOR CONTROL.

3,458,731. PRECISION TIMING PULSE GENERATOR.

3,459,937. SELF-CHECKING SYSTEM FOR A VEHICLE SEPARATION SYSTEM.

3,466,524. SPEED TAPER BRAKE MODULATION SYSTEM.

3,466,651. SIGNALLING SYSTEM.

3,468,389. PROPULSION UNITS FOR USE WITH ELECTRIC DRIVE VEHICLES.

3,476,932. RAIL VEHICLE LOCATION AND CONTROL SYSTEM.

3,479,502. RAIL VEHICLE DETECTION SYSTEM.

3,479,527. MINIMUM QUANTITY SELECTOR WITH FAIL-SAFE OVERRIDE.

3,489,892. TERMINATION CIRCUIT FOR RAIL VEHICLE DETECTION SYSTEM.

3,490,042. DIRECT CURRENT MEASURING REACTANCE ARRANGEMENT.

3,495,092. FAIL SAFE VOLTAGE-TO-CURRENT TRANSLATING CIRCUIT.

3,500,190. VEHICLE VELOCITY MEASURING SYSTEM EMPLOYING ADJUSTABLE WIDTH PULSE GENERATING SYSTEM.

3,515,970. MOTOR CONTROL SYSTEM USING CURRENT DIVERTER.

3,525,027. REGULATED DYNAMIC BRAKING CIRCUIT.

3,546,593. RECEIVER FOR FREQUENCY MODULATED RADIO-FREQUENCY SIGNALS.

3,562,515. TAPERED BRAKING RATE FOR TRACTION.

The RCA Corporation offers to grant non-exclusive licenses on reasonable terms and conditions under the following 261 patents.

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D. 219,886. TELEVISION RECEIVER OR SIMILAR ARTICLE.

D. 221,951. KEYBOARD FOR A COMPUTER OR SIMILAR ARTICLE.

Re. 27,072. INTEGRAL PULSE SWITCHING SYSTEMS.

Re. 27,134. KEYED BURST SEPARATOR.

3,560,275. FABRICATING SEMICONDUCTOR DEVICES.

3,560,357. ELECTROETCHING OF A CONDUCTIVE FILM ON AN INSULATING SUBSTRATE.

3,560,779. SHADOW MASK TYPE COLOR PICTURE TUBE WITH A FINE MESH FLEXIBLE PARTICLE SHIELD BETWEEN THE GUN AND TARGET PORTIONS.

3,560,789. GASEOUS ELECTRIC DISCHARGE TUBE INCLUDING A PLURALITY OF PUNCTURABLE GAS STORAGE CELLS.

3,560,842. SOLID STATE REGULATED POWER SUPPLY FOR INTERMITTENT LOADS WITH PLURAL CHARGING PATHS FOR A CAPACITOR.

3,560,865. DIRECT COUPLED AM DETECTOR.

3,560,887. DIRECTIONAL FILTER COMPRISING A RESONANT LOOP COUPLED TO A TRANSMISSION LINE PAIR.

3,560,893. SURFACE STRIP TRANSMISSION LINE AND MICROWAVE DEVICES USING SAME.

3,560,976. FEED SYSTEM.

3,562,404. SEMICONDUCTOR DEVICE.

3,562,555. MEMORY PROTECTION CIRCUIT.

3,562,559. P-MOS MULTIVIBRATOR.

3,562,665. MICROWAVE OSCILLATOR INCLUDING TWO BULK NEGATIVE RESISTANCE DEVICES IN A THREE-TERMINAL CAVITY.

3,562,669. FEEDBACK TYPE OSCILLATOR WITH INPUT STABILIZING MEANS.

3,562,709. CORRECTION OF BLOCK ERRORS IN A TRANSMISSION OF DATA.

3,562,714. TRANSCENDENTAL FUNCTION GENERATOR.

3,564,108. COAXIAL TRANSMISSION LINE.

3,564,125. TELEVISION INTEGRATED I.F. AMPLIFIER CIRCUITS.

3,564,130. ELECTRONIC PHOTOCOPY SYSTEM.

3,564,131. SPATIALLY MODULATED HALFTONE DOT IMAGE GENERATION SYSTEM.

3,564,135. INTEGRATED DISPLAY PANEL UTILIZING FIELD EFFECT TRANSISTORS.

3,564,141. SYNC REGENERATOR.

3,564,158. TAPE LIFTER.

3,564,325. DISPLAY DEVICE INCLUDING A POINT IMAGE.

3,564,436. HIGH INPUT IMPEDANCE AMPLIFIER.

3,564,438. SIGNAL TRANSLATING CIRCUIT HAVING FIRST AND SECOND PAIRS OF SEMICONDUCTOR DEVICES WITH MATCHING CONDUCTION CHARACTERISTICS.

3,565,702. DEPOSITING SUCCESSIVE EPITAXIAL SEMICONDUCTIVE LAYERS FROM THE LIQUID PHASE.

3,566,013. OPTICAL REDUCTION OF LUMINANCE TO CHROMINANCE CROSSTALK IN COLOR TELEVISION CAMERAS.

3,566,016. COLOR TELEVISION CAMERA ENCODING SYSTEM.

3,566,017. TELEVISION COLOR DIFFERENCE SIGNAL ENCODING SYSTEM.

3,566,018. COLOR TELEVISION SIGNAL GENERATING SYSTEM.

3,566,084. DISCONTINUITY DETECTOR.

3,566,110. ELECTROSTATIC CHARGING APPARATUS WITH MEANS TO BLOW ELECTROSTATIC CHARGE ONTO A PHOTOCONDUCTIVE SURFACE.

3,566,172. LIGHT DEFLECTION SYSTEM.

3,566,246. CURRENT REGULATOR UTILIZING A FLOATING REFERENCE VOLTAGE SUPPLY.

3,566,295. SERVO SYSTEM INCLUDING DIFFERENTIAL AND UNBALANCE AMPLIFIERS.

3,566,321. ADHESIVE MOUNTING MEANS FOR A CATHODE RAY TUBE-YOKE COMBINATION.

3,566,357. MULTI-PROCESSOR MULTI-PROGRAMMED COMPUTER SYSTEM.

3,567,862. MONITORING OF PAL SIGNAL WAVEFORMS.

3,567,998. CORNER EDGE CONNECTOR FOR PRINTED CIRCUIT BOARDS.

3,568,174. COMPENSATED READBACK CIRCUIT.

3,568,178. ELECTRONIC PHOTOCOMPOSITION SYSTEM.

3,568,761. SEMICONDUCTOR MOUNTING ADAPTER.

3,568,762. HEAT PIPE.

3,568,907. REDUCTION OF TAPE STICTION.

3,569,613. COLOR SUBCARRIER OSCILLATORS.

3,569,620. AUTOMATIC VIDEO SIGNAL GAIN CONTROLLING APPARATUS.

3,569,637. GAS ENVIRONMENT FOR RECORDER-REPRODUCER SYSTEMS.

3,569,740. SIGNAL TRANSLATING SYSTEM PROVIDING AMPLIFICATION AND LIMITING.

3,569,773. AUTOMATIC RETURN-TO-CENTER DEFLECTION CIRCUIT.

3,569,798. DOUBLE HEAT SINK SEMICONDUCTOR DEVICE.

3,569,867. TEMPERATURE-COMPENSATED FREQUENCY-VOLTAGE LINEARIZING CIRCUIT.

3,569,868. NONRECIPROCAL MICROWAVE DEVICES USING A SEMICONDUCTOR ELEMENT.

3,569,870. FEED SYSTEM.

3,570,622. SPEED CONTROL FOR MOTOR VEHICLES.

3,571,743. PHASE LOCK LOOP.

3,572,551. APPARATUS FOR MONITORING AND CONTROLLING THE CONCENTRATION OF TONER IN A DEVELOPER MIX.

3,572,672. VACUUM EVAPORATION APPARATUS.

3,572,922. APPARATUS FOR DEVELOPING ELECTROSTATIC IMAGES.

3,572,941. PHOTOCHROMIC DEVICE BASED UPON PHOTON ABSORPTION.

3,573,176. SELECTIVE ANODIZATION APPARATUS AND PROCESS.

3,573,354. COLOR KILLER AND A. C. C. CIRCUITS.

3,573,365. VIDEO MUTING CIRCUITS.

3,573,488. ELECTRICAL SYSTEM AND LSI STANDARD CELLS.

3,573,492. NOISE IMMUNITY CIRCUIT.

3,573,498. COUNTER OR SHIFT REGISTER STAGE HAVING BOTH STATIC AND DYNAMIC STORAGE CIRCUITS.

3,573,631. OSCILLATOR CIRCUIT WITH SERIES RESONANT COUPLING TO MIXER.

3,573,645. PHASE SPLITTING AMPLIFIER.

3,573,785. STROBOSCOPIC DISPLAY APPARATUS.

3,573,786. COMPENSATION CIRCUIT FOR ELECTRONIC PHOTOCOMPOSITION SYSTEM.

3,573,832. UHF TELEVISION ANTENNA.

3,574,613. METHOD OF ELECTROSTATIC RECORDING ON A THERMOPLASTIC RECORDING ELEMENT.

3,574,664. ROOM TEMPERATURE ELECTROLESS NICKEL PLATING BATH.

3,575,491. DECREASING RESPONSE TIME OF LIQUID CRYSTALS.

3,575,492. TURN-OFF METHOD AND CIRCUIT FOR LIQUID CRYSTAL DISPLAY ELEMENT.

3,575,493. FAST SELF-QUENCHING OF DYNAMIC SCATTERING IN LIQUID CRYSTAL DEVICES.

3,575,555. SPEECH SYNTHESIZER PROVIDING SMOOTH TRANSITION BETWEEN ADJACENT PHONEMES.

3,575,608. CIRCUIT FOR DETECTING A CHANGE IN VOLTAGE LEVEL IN EITHER SENSE.

3,575,612. FET CONTROL SYSTEM EMPLOYING A STORAGE CAPACITOR AND SWITCHING TUBE MEANS.

3,575,617. FIELD EFFECT TRANSISTOR, CONTENT ADDRESSED MEMORY CELL.

3,575,627. CATHODE RAY TUBE WITH SCREEN COMPRISING LASER CRYSTALS.

3,575,743. METHOD OF MAKING A PHOSPHORUS GLASS PASSIVATED TRANSISTOR.

3,576,364. COLOR ADVERTISING DISPLAY EMPLOYING LIQUID CRYSTAL.

3,576,390. APPARATUS FOR GENERATING TEST SIGNALS USEFUL IN MEASURING TELEVISION TRANSMISSION PERFORMANCE WITHOUT AFFECTING RECEIVER SYNCHRONIZATION.

3,576,391. TELEVISION SYSTEM FOR TRANSMITTING AUXILIARY INFORMATION DURING THE VERTICAL BLANKING INTERVAL.

3,576,392. SEMICONDUCTOR VIDICON TARGET HAVING ELECTRONICALLY ALTERABLE LIGHT RESPONSE CHARACTERISTICS.

3,576,448. CIRCUIT PRODUCING OUTPUT PULSE OF POLARITY DEPENDENT ON RELATIVE TIMES OF OCCURRENCE OF INPUT PULSES.

3,576,461. CONSTANT VELOCITY VECTOR GENERATOR.

3,576,494. DIGITAL COMPUTER CONTROLLED TEST SYSTEM.

3,576,542. PRIORITY CIRCUIT.

3,576,546. PHOTOCHROMIC-PHOTOCONDUCTIVE MEMORY.

3,576,551. REPAIR OF THIN-FILM STRUCTURE SUCH AS CRYOELECTRIC MEMORY.

3,577,008. AUTOMATIC FREQUENCY CONTROL APPARATUS.

3,577,065. SWITCHING REGULATOR HAVING A DIODE CONNECTED TO AN INTERMEDIATE TAP OF A CHOKE.

3,577,087. SEQUENCE 'AND' GATE WITH RESETTING MEANS.

3,577,166. C-MOS DYNAMIC BINARY COUNTER.

3,577,167. INTEGRATED CIRCUIT BIASING ARRANGEMENTS.

3,577,174. CIRCUIT FOR STARTING AND MAINTAINING A DISCHARGE THROUGH A GAS DISCHARGE TUBE.

3,577,181. TRANSISTOR PACKAGE FOR MICROWAVE STRIPLINE CIRCUITS.

3,578,836. RETRIEVAL OF HOLOGRAPHICALLY RECORDED DATA.

3,578,899. AUTOMATIC CHROMA CONTROL CIRCUIT.

3,578,900. VIDEO AMPLIFIER CIRCUIT.

3,578,901. VIDEO AMPLIFIER FOR DRIVING A DELAY LINE BETWEEN GROUNDED COLLECTOR AND GROUNDED BASE STAGES.

3,578,902. APPARATUS FOR SYNCHRONIZED GENERATION OF A SIGNAL FROM A COMPOSITE COLOR VIDEO SIGNAL SUBJECTED TO SIGNAL PERTURBATIONS.

3,578,903. CONTROL CIRCUITS FOR PREVENTING KINESCOPE COLOR SATURATION DURING BLOOMING.

3,578,989. PULSE WIDTH STABILIZED MONOSTABLE MULTIVIBRATOR.

3,579,057. METHOD OF MAKING A SEMICONDUCTOR ARTICLE AND THE ARTICLE PRODUCED THEREBY.

3,579,095. CIRCUITS USING TRANSISTORS TO PROVIDE VARIABLE PHASE SHIFT.

3,579,112. AUTOMATIC GAIN CONTROL SYSTEMS.

3,579,133. SIGNAL TRANSLATING STAGE.

3,579,144. RELAXATION OSCILLATOR GATED BY TRANSISTOR SWITCH.

3,579,160. BUSH BUTTON MECHANISM.

3,579,189. COUPLING AND DRIVING CIRCUIT FOR MATRIX ARRAY.

3,579,206. LOW INDUCTANCE INTERCONNECTION OF A CRYOELECTRIC MEMORY SYSTEM.

3,579,225. LIGHT PROBE CIRCUIT FOR PERSISTENT SCREEN DISPLAY SYSTEM.

3,579,267. DECIMAL TO BINARY CONVERSION.

3,579,332. SINGLE CRYSTAL ZINC OXIDE AND AN ELECTROPHOTOGRAPHIC PLATE MADE THEREFROM.

3,579,375. METHOD OF MAKING OHMIC CONTACT TO SEMICONDUCTOR DEVICES.

3,580,995. CONSTANT SIZED HALFTONE DOT IMAGE GENERATOR.

3,581,002. DISPLAY DEVICE FOR PROVIDING GRATICULES OF VARIOUS CONFIGURATIONS.

3,581,162. OPTICAL SEMICONDUCTOR DEVICE.

3,581,244. AUTOMATIC IMPEDANCE MATCHING CIRCUITS FOR VARIABLE FREQUENCY SOURCE.

3,582,202. PROJECTION OF COLOR-CODED B AND W TRANSPARENCIES.

3,582,389. METHOD FOR METALLIZING PHOSPHOR SCREENS.

3,582,390. METHOD OF METALLIZING PHOSPHOR SCREENS USING AN AQUEOUS EMULSION CONTAINING HYDROGEN PEROXIDE.

3,582,394. METHOD OF COATING WIDE-ANGLE CATHODE RAY PICTURE TUBE ENVELOPES.

3,582,408. MAGNETOSTRICTIVE ELEMENT.

3,582,544. TEST SIGNAL GENERATOR FOR PRODUCING TEST PATTERNS FOR A TELEVISION RECEIVER.

3,582,545. AUTOMATIC BLACK LEVEL VIDEO SIGNAL CLIPPING AND CLAMPING SYSTEM.

3,582,727. HIGH VOLTAGE INTEGRATED CIRCUIT INCLUDING AN INVERSION CHANNEL.

3,582,760. FREQUENCY MULTIPLIER.

3,582,831. LOW RELUCTANCE RESONANT STRUCTURE IN WAVEGUIDE FOR ISOLATING D.C. MAGNETIC FIELDS.

3,582,907. LIGHT APERTURE MATRIX.

3,583,250. TRANSMISSION INCLUDING TOOTHED BELT AND PARTIALLY TOOTHED PULLEY.

3,584,147. CROSSTALK REDUCTION IN FILM PLAYER.

3,584,148. CONTINUOUS MOTION APPARATUS FOR TV FILM SCANNING.

3,584,149. REGISTRATION APPARATUS FOR TELEVISION FILM PROJECTION SYSTEM.

3,584,240. TRIGGER PULSE CIRCUITS.

3,584,650. REED ARMATURE VALVES FOR CONTROLLING FLUID FLOW.

3,585,113. PROCESS FOR FABRICATING REPLICATING MASTERS.

3,585,284. COLORED LIGHT ENCODING FILTER.

3,585,290. CODING ARRANGEMENTS FOR MULTIPLEXED MESSAGES.

3,585,295. VIDEO AMPLIFIER.

3,585,312. SIGNAL TRANSMISSION IN RECORDER SYSTEMS WITH IMPEDANCE TRANSFORMATION.

3,585,430. GALLIUM ARSENIDE PHOSPHIDE CAMERA TUBE TARGET HAVING A SEMI-INSULATING LAYER ON THE SCANNED SURFACE.

3,585,431. SHADOW-MASK CATHODE RAY TUBE INCLUDING A MASKING MEMBER COMPRISING A SKIRT HAVING INDENTATIONS AND PROJECTIONS.

3,585,460. MINIATURE CERAMIC CAPACITOR AND METHOD OF MANUFACTURE.

3,585,465. MICROWAVE POWER TRANSISTOR WITH A BASE REGION HAVING LOW-AND-HIGH CONDUCTIVITY PORTIONS.

3,585,596. DIGITAL SIGNALLING SYSTEM.

3,585,952. SELF RIGHTING VESSEL.

3,586,356. CLAMP ASSEMBLY.

3,586,359. STRUCTURAL CORNER.

3,586,755. TEST SIGNAL GENERATOR.

3,586,769. VIDEO TAPE REPRODUCER SYSTEM HAVING AUTOMATIC STANDARD SELECTION.

3,586,917. SEMICONDUCTOR HYBRID POWER MODULE PACKAGE.

3,586,925. GALLIUM ARSENIDE DIODES AND ARRAY OF DIODES.

3,586,946. SERVO SYSTEM.

3,586,999. FIELD-EXCITED SEMICONDUCTOR LASER WHICH USES A UNIFORMLY DOPED SINGLE CRYSTAL.

3,587,043. CHARACTER PARITY SYNCHRONIZER.

3,587,087. DIGITAL COMPANDING LOOP FOR MONOBIT ENCODER/DECODER.

3,587,110. CORPORATE-NETWORK PRINTED ANTENNA SYSTEM.

3,587,148. METHOD OF ASSEMBLY OF ELECTRON TUBES.

3,587,521. APPARATUS FOR MONITORING AND CONTROLLING THE CONCENTRATION OF POWDER PARTICLES IN A MIXTURE OF POWDER AND MAGNETIC PARTICLES.

3,588,224. ADJUSTABLE BANDWIDTH OPTICAL FILTER.

3,588,225. ELECTRO-OPTIC DEVICES FOR PORTRAYING CLOSED IMAGES.

3,588,325. COLORED LIGHT TRANSMISSION COMPENSATING ENCODING FILTER.

3,588,326. LENS ARRAY IMAGING SYSTEM FOR A COLOR ENCODING CAMERA.

3,588,338. GAMMA CORRECTION AND SHADING MODULATION CIRCUITRY FOR A TELEVISION CAMERA.

3,588,351. TELEVISION BLANKING AND SYNCHRONIZING SIGNAL GENERATOR.

3,588,353. SPEECH SYNTHESIZER UTILIZING TIMEWISE TRUNCATION OF ADJACENT PHONEMES TO PROVIDE SMOOTH FORMANT TRANSITION.

3,588,363. WORD RECOGNITION SYSTEM FOR VOICE CONTROLLER.

3,588,439. HIGH RESOLUTION LASER ENGRAVING APPARATUS.

3,588,449. ELECTRONIC CHECK CASHING SYSTEM.

3,588,545. J-K′ FLIP-FLOP USING DIRECT COUPLED GATES.

3,588,551. ADAPTIVE RESONANT FILTER.

3,588,566. ELECTROMAGNETIC DEFLECTION YOKE HAVING BYPASSED WINDING TURNS.

3,588,568. RECTANGULAR SHADOW MASK TYPE COLOR PICTURE TUBE WITH BARREL SHAPED MASK FRAME.

3,588,575. HIGH VOLTAGE ELECTRON DISCHARGE TUBE.

3,588,635. INTEGRATED CIRCUIT.

3,588,735. UHF OR L BAND NON-FREE-RUNNING AVALANCHE DIODE POWER AMPLIFYING FREQUENCY SYNCHRONIZED OSCILLATOR.

3,588,771. METHOD AND APPARATUS FOR MANUFACTURING MAGNETIC RECORDING TAPE.

3,590,275. CONTROL CIRCUITS.

3,590,308. HIGH VOLTAGE ELECTRON DISCHARGE TUBE HAVING ANODE TARGET.

3,591,108. CONTROL SYSTEM FOR SPINNING BODIES.

3,591,274. PROJECTION OF COLOR-CODED B AND W TRANSPARENCIES.

3,591,855. COMPLEMENTARY FIELD-EFFECT TRANSISTOR BUFFER CIRCUIT.

3,592,112. PHOTOGRAPHIC PRINTING OF CATHODE RAY TUBE SCREEN STRUCTURE.

3,592,528. PHOTOCHROMIC DISPLAY DEVICE.

3,593,041. DIFFERENTIAL PHASE DISTORTION COMPENSATOR FOR COLOR TELEVISION EQUIPMENT.

3,593,054. IMAGE DEVICE HAVING 100 ANGSTROM BANDWIDTH PHOSPHOR EMISSIVE IN BLUE REGION.

3,593,193. HIGH POWER AVALANCHE DIODE MICROWAVE OSCILLATORS HAVING OUTPUT FREQUENCY ABOVE DIODE TRANSIT TIME FREQUENCY.

3,594,495. RADIO FACSIMILE POSTAL SYSTEM.

3,594,520. AGITATION SWITCH.

3,594,602. DISPLAY DEVICE INCLUDING RESILIENT MOUNTING MEANS.

3,594,640. CIRCUIT AND METHOD FOR MEASURING THE AMPLIFICATION FACTOR OF AN IN-CIRCUIT OR OUT-OF-CIRCUIT TRANSISTOR.

3,594,666. GYROMAGNETIC NOTCH FILTER.

3,594,897. METHOD OF CONSTRUCTING A MAGNETIC CORE MEMORY PLANE.

3,595,505. ROTATABLE SHAFT.

3,595,804. METHOD FOR PREPARING ZINC AND ZINC-CADMIUM SULFIDE PHOSPHORS.

3,595,993. NOISE CANCELLING CIRCUITS.

3,596,136. OPTICAL SEMICONDUCTOR DEVICE WITH GLASS DOME.

3,596,208. SAWTOOTH FREQUENCY MODULATION SYSTEM INCLUDING A WAVESHAPING FREQUENCY MULTIPLIER CHAIN.

3,597,044. ELECTRO-OPTIC LIGHT MODULATOR.

3,597,639. PHASE SHIFT CIRCUITS.

3,597,658. HIGH CURRENT SEMICONDUCTOR DEVICE EMPLOYING A ZINC-COATED ALUMINUM SUBSTRATE.

3,598,646. METHOD FOR PREPARING OXIDE-COATED CATHODES.

3,598,750. PHOTOCHROMIC IMAGE DEVICE.

3,598,911. CIRCULATING MEMORY-REFRESHED DISPLAY SYSTEM.

3,598,978. OBJECT POSITIONING SYSTEM AND METHOD.

3,599,092. KINESCOPE SIMULATOR USED IN CHECKING AN AUTOMATIC TESTING SYSTEM.

3,599,093. APPARATUS INCLUDING A WIRE TIPPED PROBE FOR TESTING SEMICONDUCTOR WAFERS.

3,599,146. MEMORY ADDRESSING FAILURE DETECTION.

3,599,184. STORAGE CIRCUIT.

3,599,192. TRANSDUCER SUPPORTING ARRANGEMENT FOR DISK MEMORY.

3,600,061. ELECTRO-OPTIC DEVICE HAVING GROOVES IN THE SUPPORT PLATES TO CONFINE A LIQUID CRYSTAL BY MEANS OF SURFACE TENSION.

3,600,083. ELECTROSTATIC PRINTING SYSTEM EMPLOYING A REPLACEABLE CARTRIDGE TO PROVIDE A SUPPLY OF A RECORDING ELEMENT AND PROCESSING MEANS THEREFOR.

3,600,089. FILM MERGING UNIT.

3,600,246. METHOD OF MAKING LAMINATED SEMICONDUCTOR DEVICES.

3,600,511. APPARATUS FOR CONTROLLING THE OPERATING POTENTIAL OF A VIDICON.

3,600,513. PROCESS FOR RAPID RECORDING OF POLYGONAL IMAGES.

3,600,561. DECADE COUNTER EMPLOYING LOGIC CIRCUITS.

3,600,635. PROTECTION CIRCUIT INCLUDING A THYRISTOR AND A THREE TERMINAL DEVICE.

3,600,646. POWER TRANSISTOR.

3,600,649. HIGH POWER AVALANCHE DIODE.

3,600,699. FREQUENCY SYNTHESIZER HAVING A PLURALITY OF CASCADED PHASE LOCKED LOOPS.

3,601,465. HOLOGRAPHIC STORAGE AND RETRIEVAL OF INFORMATION.

3,601,529. COLOR TELEVISION SIGNAL-GENERATING APPARATUS.

3,601,647. HIGH POWER ELECTRON DISCHARGE DEVICE HAVING ANODE WITH IMPROVED HEAT DISSIPATION CAPABILITY.

3,601,812. MEMORY SYSTEM.

3,602,570. APPARATUS FOR MAKING ANNULAR HOLOGRAMS.

3,602,773. AC OVERCURRENT PROTECTION CIRCUIT.

3,602,780. RADIAL HIGH FREQUENCY POWER TRANSISTOR EMPLOYING PERIPHERAL EMITTER CONTACT RING AND HIGH CURRENT BASE CONTACT LAYER.

3,602,821. NOISE IMMUNE PURE CARRIER DETECTOR CIRCUIT.

3,602,822. TELEVISION ELECTRONIC CONTROL CIRCUIT FOR CHANNEL SELECTIONS.

3,602,823. ELECTRONIC SWITCHING OF TUNED CIRCUITS.

3,602,839. INVERTER INCLUDING COMPLEMENTARY TRANSISTORS.

3,603,732. INSTANT-ON CIRCUITRY FOR SOLID STATE TELEVISION RECEIVERS.

3,603,962. COLOR DISPLAY FOR COMPUTER TERMINAL.

3,603,984. PANEL STRUCTURE FOR MATRIX ADDRESSED DISPLAYS.

3,604,080. METHOD FOR MAKING AN ELECTRON-TUBE GRID ASSEMBLY.

3,604,504. FLEXIBLE HEAT PIPE.

3,604,842. AUTOMATIC CHROMA CONTROL CIRCUITS.

3,604,843. AMPLIFIER CIRCUITS.

3,604,987. RADIATION-SENSING DEVICE COMPRISING AN ARRAY OF PHOTODIODES AND SWITCHING DEVICES IN A BODY OF SEMICONDUCTOR MATERIAL.

3,605,074. ELECTRICAL CONNECTOR ASSEMBLY HAVING COOLING CAPABILITY.

3,605,977. THREE-AXIS DRIVE SYSTEM.

3,606,523. FLUID VARIABLE LIGHT DEFLECTOR.

3,606,677. MULTILAYER CIRCUIT BOARD TECHNIQUES.

3,609,004. LIGHT DEFLECTION SYSTEM.

3,609,009. BINARY LIGHT BEAM DEFLECTOR USING ACOUSTIC WAVES.

3,609,222. ELECTRO-OPTICAL IMAGE FORMING SYSTEM.

3,609,224. COLOR TELEVISION VIDEO SIGNAL PROCESSING APPARATUS.

3,609,408. CLOCK PULSE GENERATOR.

3,609,444. CONSTANT TIME STROKE GENERATOR.

3,609,446. POWER SUPPLY UTILIZING A DIODE AND CAPACITOR VOLTAGE MULTIPLIER FOR TRACKING FOCUSING AND ULTOR VOLTAGES.

3,609,460. POWER TRANSISTOR HAVING BALLASTED EMITTER FINGERS INTERDIGITATED WITH BASE FINGERS.

3,609,687. PATTERN RECOGNIZER.

PATENT EXAMINING CORPS

R. A. WAHL, Assistant Commissioner
F. H. BRONAUGH, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF NOVEMBER 16, 1971

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—M. STERMAN, Director. Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	7-09-70
GENERAL ORGANIC CHEMISTRY, GROUP 120—I. MARCUS, Director. Heterocyclic; Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	4-24-70
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—L. J. BERCOVITZ, Director. Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	9-11-70
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—A. P. KENT, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	5-11-70
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—W. B. KNIGHT, Director. Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	6-01-70
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS AND RELATED ELEMENTS, GROUP 210—N. ANSHER, Director. Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Miscellaneous.	3-16-71
SECURITY, GROUP 220—R. L. CAMPBELL, Director. Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-21-70
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director. Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	10-02-70
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—W. L. CARLSON, Director. Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	10-23-70
PHYSICS, GROUP 280—R. L. EVANS, Director. Photography; Sound and Lighting; Indicators and Optics; Measuring and Testing; Geometrical Instruments.	9-28-70
DESIGNS, GROUP 290—R. L. CAMPBELL, Director. Industrial Arts; Household, Personal and Fine Arts.	10-12-70
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—A. BERLIN, Director. Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Railways and Railway Equipment; Brakes; Rigid Flexible and Special Receptacles and Packages.	9-02-70
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—D. J. STOCKING, Director. Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders Woodworking; Tools; Cutlery; Jacks.	8-03-70
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—A. RUEGG, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	8-07-70
HEAT, POWER AND FLUID ENGINEERING, GROUP 340—M. M. NEWMAN, Director. Power Plants; Combustion Engines; Fluid Motors; Pumps; Turbines; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Vaporizing; Temperature and Humidity Regulation; Machine Elements; Power Transmission; Fluid Handling; Lubrication; Joint Packing.	11-20-70
CONSTRUCTIONS, SUPPORTS, TEXTILES, CLEANING, GROUP 350—T. J. HICKEY, Director. Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Receptacles; Supports; Cabinet Structures; Centrifugal Separations; Cleaning; Coating; Pressing; Agitating; Foods; Textiles; Apparel and Shoes; Sewing Machines; Winding and Reeling.	8-19-70

Expiration of patents: The patents within the range of numbers indicated below expire during December 1971, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents.....Numbers 2,695,998 to 2,698,433, inclusive
Plant Patents.....Numbers 1,328 to 1,338, inclusive

PATENTS

GRANTED DECEMBER 7, 1971

GENERAL AND MECHANICAL

3,624,839

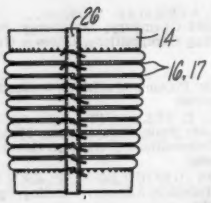
METHOD OF FORMING A ROOT CORD RESTRAINED CONVOLUTE SECTION

Michael A. Marroni, Jr., Weatogue, Conn., and John J. Korabowski, Springfield, Mass., assignors to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 20, 1968, Ser. No. 785,615

Int. Cl. A62b *17/00*

U.S. Cl. 2—2.1 2 Claims



Root cords utilized to constrain restraint fabric so as to form convolutes in a pressurized suit are slidably disposed on the fabric, thereby permitting fabrication of root restrained fabric suit sections from sheets of fabric, and also permitting adjustability of root diameters to vary the sizes of suits, and to accommodate minor tailored changes to improve comfort and mobility when the suit is being worn. cords are restrained by stitching and cloth tunnels.

3,624,840

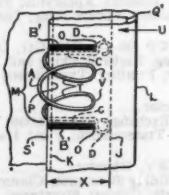
GARMENT FASTENER

Raymond T. Kahn, 1551 N. Rural St., Indianapolis, Ind. 46201

Filed Jan. 29, 1970, Ser. No. 6,810

Int. Cl. A41b *1/10*

U.S. Cl. 2—128 6 Claims



A fastener intended to replace button-type fasteners employed at intervals on a hem in the form of a resilient member such as wire or the like which includes a loop-type tongue with transfer leads extending from the tongue into mounting wings for mounting the fastener on a hem with the tongue adapted to engage an overlapping hem to retain the hems in overlapping position.

3,624,841

CONTINUOUSLY PRODUCED PANTY HOSE WITH ATTACHED PANTY

Gerald Lewis, Riverdale, N.Y., assignor to Joseph Bancroft & Sons Company, New York, N.Y.

Filed Nov. 25, 1969, Ser. No. 879,724

Int. Cl. A41b *9/04*

U.S. Cl. 2—224 R 8 Claims

Bikini-type panty hose with attached panty and a method for producing such panty hose wherein the panty portion is formed from the panty hose garment itself. The bikini-type panty hose is made by appropriately scalloping opposite upper corners of a panty hose garment to create leg openings and a panty crotch portion, sewing the leg openings and crotch portion and inverting the upper portion along a predetermined line to form a panty. Elasticized material is attached at the waist and leg openings.

3,624,842

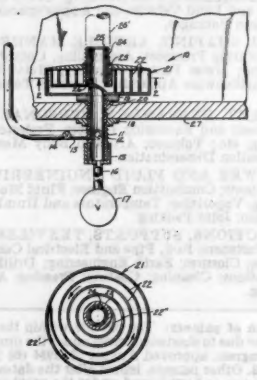
ANTI-SWEAT ATTACHMENT FOR TOILETS

Clarence B. Harrison, 6148 E. Court St., Davison, Mich. 48422

Filed May 18, 1970, Ser. No. 38,333

Int. Cl. A47k *17/00*; E03d *1/20*

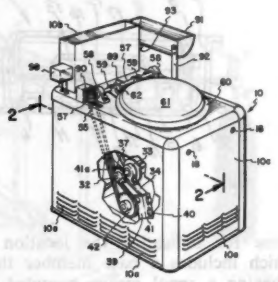
U.S. Cl. 4—1 5 Claims



A device for preventing the sweating of toilet tanks and the like. This device includes a spiral convoluted chamber

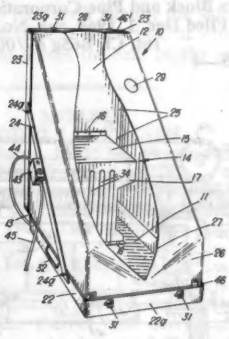
for mixing hot water with the cold water in the toilet tank closet. The device is of such construction as to be adaptable for the interior or exterior of the toilet tank closet.

3,624,843
COMBUSTION TOILET
Charles M. Andrus, Salt Lake City, Utah, assignor to Universal Development Company
Filed Aug. 25, 1966, Ser. No. 575,074
Int. Cl. A47k *11/02*
U.S. Cl. 4—131 **24 Claims**



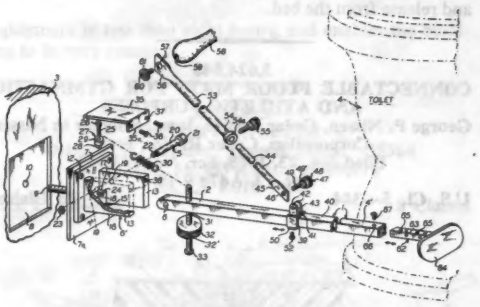
A combustion toilet having a housing with a toilet seat thereon. Rotating pockets arranged to be rotated from a waste receiving position beneath the toilet seat to a position wherein the pockets form part of a combustion chamber, a burner in the combustion chamber arranged to subject the interiors of the pockets to a cleanout flame when the pockets form part of the combustion chamber and a vent through which gaseous products of combustion are released from the combustion chamber. Rotation of the pockets and operation of the burner are responsive to movement of the associated toilet lid.

3,624,844
STEAM OR VAPOUR BATH
Wallace Samuel Sharps, Penn, near High Wycombe, Buckinghamshire, England, assignor to Medexport Limited, London, England
Filed Dec. 2, 1969, Ser. No. 881,552
Claims priority, application Great Britain, Dec. 3, 1968, 57,378/68
Int. Cl. A61n *33/06*
U.S. Cl. 4—160 **5 Claims**



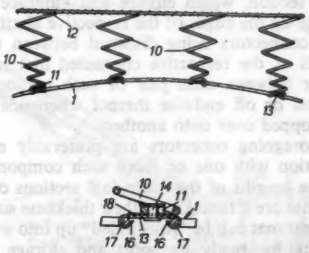
A steam or vapour bath comprises a cabinet within which a person may be seated, the cabinet including a base pivotally connected to a wall, said base and said wall being adapted to be moved relative to each other between, and to be retained in, an operative position in which the wall is substantially perpendicular to the base, and an inoperative position in which said wall is disposed adjacent and substantially parallel to the base. A seat is provided which is mounted within the cabinet and is pivotally connected thereto in such a way as to be moved between operative and inoperative positions when the base and wall are similarly so moved, the seat having a portion which, in the operative position, extends substantially perpendicular to said wall.

3,624,845
FOOT OPERATED TOILET FLUSH DEVICE
Otto Vorgang, 68 W. 70th St., New York, N.Y. 10023
Filed Mar. 16, 1970, Ser. No. 19,797
Int. Cl. E03d *5/00*
U.S. Cl. 4—249 **22 Claims**



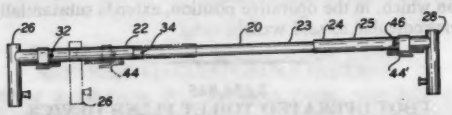
A foot operated toilet flush, comprising a housing adapted to be mounted on a wall adjacent to but spaced from the floor, a substantially horizontally extending one-arm lever pivotally mounted at one end to the housing so as to pivot in substantially a vertical plane, at least one upwardly extending arm operatively connected to the lever and adapted to be secured at its upper portion to a toilet flush arm, and means disposed within said housing for biasing the lever into the substantially horizontally extending position, constituting an inoperative rest position.

3,624,846
SPRING UNITS
Ignacz Rub, 38 Park Drive, Golders Green, London, NW. 11, England
Filed Feb. 25, 1970, Ser. No. 14,175
Claims priority, application Great Britain, Feb. 26, 1969, 10,403/69
Int. Cl. A47c *23/04, 25/00*
U.S. Cl. 5—259 **5 Claims**



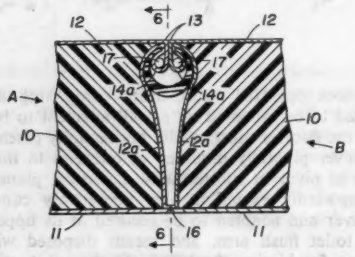
A spring unit comprising a spring layer formed from one or more serpentine-shaped springs and a second spring layer formed from coiled springs which are connected to the serpentine-shaped springs.

3,624,847
ADJUSTABLE BED RAIL UNIT
Charles E. Murcott, Huntington, and Arthur Salerno, Bay Shore, N.Y., assignors to Lumex, Inc., Bay Shore, N.Y.
Filed Apr. 30, 1969, Ser. No. 820,441
Int. Cl. A47c 21/00
U.S. Cl. 5—331 8 Claims



A guard rail unit for hospital beds or the like including an adjustable spring-loaded frame assembly for mounting on differently sized bed frames. The frame assembly includes a guide and clamping device for quick assembly and release from the bed.

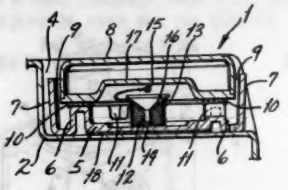
3,624,848
CONNECTABLE FLOOR MATS FOR GYMNASTIC AND ATHLETIC PURPOSES
George P. Nissen, Cedar Rapids, Iowa, assignor to Nissen Corporation, Cedar Rapids, Iowa
Filed Jan. 23, 1969, Ser. No. 793,353
Int. Cl. A47g 9/00
U.S. Cl. 5—344 26 Claims



Gymnastic and athletic floor mats are disclosed composed of a succession of abutting rectangular mat sections, each individual section consisting of shock absorbing filler material enclosed by flexible sheet covers and permanently jointed to its neighbor by the top covers only of the two. Two or more such mats, each having several such sections, may be quickly and easily removably connected together, both end-to-end and/or side-to-side, to form large expanses of relatively unbroken mat top surface. The latter is accomplished by joining the top covers only of the respective individual abutting sections of the component mats by removable slotted tubular connectors, generally C-shaped in cross section, which engage and embrace projections formed along the edges of the respective abutting top covers, the connectors being disposed between the abutting side walls of the respective connected mat sections. The connector between each pair of such sections is readily slipped on or off endwise thereof when one component mat is flopped over onto another.

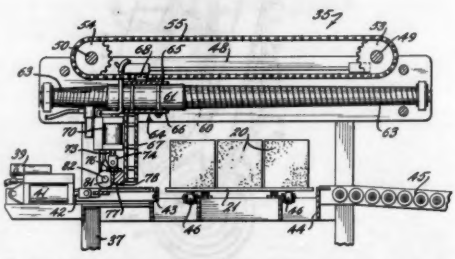
The foregoing conectors are preferably employed in combination with one or more such component mats in which the lengths of the individual sections of each component mat are a function of their thickness such that each component mat can be "roll-folded" up into a single, compact stack for ready transport and storage without the need first to separate it into its individual sections or groups of sections. One or more such mats are then removably joined to each other, end-to-end and/or side-to-side, by the aforesaid connectors in order to permit a wide range of mat sizes and shapes to be assembled from a few basic "roll-foldable" mats. The removably joined mats can be "roll-folded" together as one mat as well as individually "roll-folded" when disconnected.

3,624,849
DEVICE FOR LOCATING A SUBMERGED ITEM
Elmer F. Brannaker, 811 Brookvale Terrace, Manchester, Mo. 63011
Filed Nov. 6, 1969, Ser. No. 874,487
Int. Cl. B63c 7/26
U.S. Cl. 9—9 4 Claims



A device for indicating the location of submerged items which includes a base member that is generally formed having a spool means mounted centrally to it, with the sides of said base member projecting upwardly coextensive with the spool means so as to provide for its shelter, a float connects by means of a soluble glue and/or an intermediate porous member to the base member, and a length of line is normally wound around said spool connecting to said base member at one end, with the other end of said line attaching to the float; when the item to which this device connects becomes submerged in water the soluble glue rapidly dissolves allowing for the float to elevate to the surface, thereby indicating the location of the submerged item. In other embodiments, the base member is formed having a clip-like arrangement for mounting of the device to, as for example, a fishing rod, while in another embodiment the spool and float may be connected inwardly of a series of cavities provided in the end of a handle portion of a fishing rod, and function similarly to the device previously described to indicate the location of the rod in the event that it is lost in any depth of water.

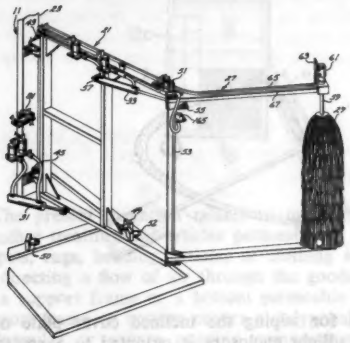
3,624,850
BUILDING BLOCK SWEEP AND PALLET SCRAPER
Richard C. Thompson, Chesapeake, Va., assignor to Southern Block and Pipe Corporation, Norfolk, Va.
Filed Dec. 1, 1969, Ser. No. 881,042
Int. Cl. B65g 69/00
U.S. Cl. 15—4 10 Claims



Apparatus for removing articles from pallets on which they have been formed while in a plastic state and have

hardened, and for simultaneously scraping the pallets to remove unwanted residue and place the pallets in condition to receive other articles to be formed.

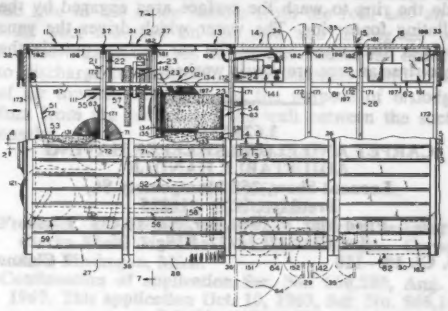
3,624,851
PROGRAMMED CAR WASHING APPARATUS
Ivan J. Barber, 559 Evans Ave., Toronto 14, Ontario, Canada
Filed Nov. 5, 1968, Ser. No. 773,526
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 D **10 Claims**



A car washing apparatus comprising a primary arm pivotally supported at one side of a path of a car to be washed and normally projecting rearwardly along said path. A secondary arm is pivotally supported on one end from the free end of the primary arm and normally projects transversely of the car path to mount a rotary brush on its free end for normal disposition centrally in said path. A first hydraulic-pneumatic cylinder urges the secondary arm to its unfolded position relative to said primary arm and a second hydraulic pneumatic cylinder controls the primary arm. When a forwardly moving car contacts the brush, the primary arm will be retracted to pull the brush across the front of the car and the forwardly moving car will fold the secondary arm on the primary arm. When the brush reaches the front corner of said car, the first cylinder will continue to urge the secondary arm to its unfolded position thus moving the brush rearwardly along said one side. Immediately after the brush clears the front corner of the car, the pressure to the second cylinder will be switched to extend the primary arm and hold the brush against the side of the car until the rear corner thereof is reached, at which time the brush will be moved across the rear of the car.

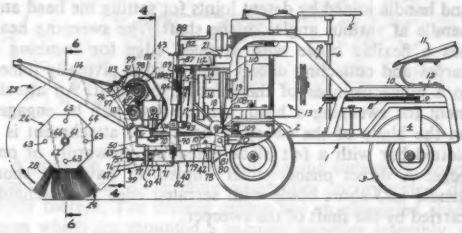
3,624,852
MODULE CAR WASH
Daniel C. Hanna, 16325 SE. Cherry Court, Milwaukie, Oreg. 97222
Continuation of application Ser. No. 826,067, May 12, 1969, which is a continuation of application Ser. No. 642,935, June 1, 1967. This application June 15, 1970, Ser. No. 48,876
Int. Cl. B60s *3/06*
U.S. Cl. 15—21 D **21 Claims**

A plurality of separate, arched frames carry siding sections on the sides thereof and carry car brushing, spraying and drying mechanisms to form modules which can be shipped separately. The frames can be assembled in side-by-side arrangement to form both the sidewalls and framing of a building as well as the support of the car brushing, spraying and drying mechanisms. Roof sections placed on the assembled frames complete the building. This construction permits assembly of a complete car wash including the building and all the car washing



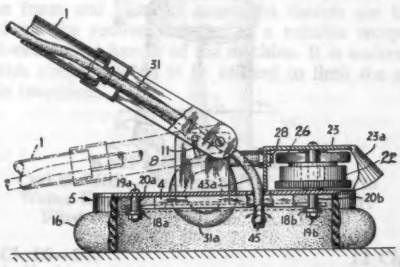
equipment in less than eight hours, and enables the building to be very compact.

3,624,853
ROTARY SWEEPER
Orlando W. Kromer, Mound, Minn. 55364
Filed Nov. 16, 1970, Ser. No. 89,876
Int. Cl. E01h *1/02*
U.S. Cl. 15—82 **8 Claims**



A pair of axially aligned cylindrical brooms having inner ends each mounted on an opposite end of a rotary shaft for common rotation therewith, and supporting structure and a rotary power transmission element for the shaft disposed between the inner ends of the brooms, the shaft providing the sole support for at least one of the brooms from the supporting structure, whereby the outer end of at least one of the brooms is unobstructed.

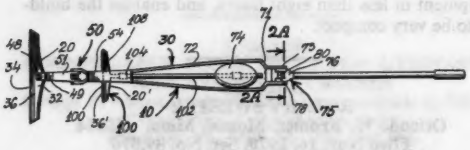
3,624,854
CAR WASHER
Edward W. Strong, Setauket, N.Y. (Curtis Road, Boxford, Mass. 01921)
Filed Aug. 26, 1969, Ser. No. 853,128
Int. Cl. B60s *3/04*
U.S. Cl. 15—97 **17 Claims**



A car washer comprises a foam ring carried by a base plate mounted for oscillation at the end of a long tubular

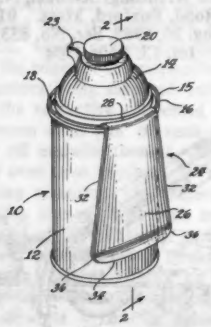
handle. The base plate and foam ring are oscillated by eccentric weights rotated by vane wheels driven by wash water supplied through the handle. A detergent-water mixture is also supplied through the handle and is discharged inside the ring to wash the surface area engaged by the oscillating foam ring. The water which drives the vane wheels is discharged against the car surface outside the ring to rinse an area previously washed.

3,624,855
CARPET AND FLOOR SWEEPER HAVING ADJUSTABLE HANDLE
Leonard Shaw, 358 Montgomery St., Brooklyn, N.Y. 11225
Filed Mar. 4, 1970, Ser. No. 16,483
Int. Cl. A47l *13/12*; B25g *1/06*
U.S. Cl. 15—118 **9 Claims**



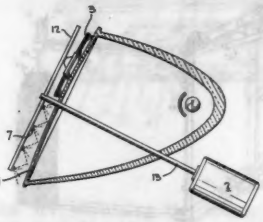
A carpet and floor sweeper has a sweeping head, shaft and handle joined by detent joints for setting the head and handle at various angles to the shaft. The sweeping head has a flexible blade with serrated edge for combing a carpet and collecting debris. The head is pivotally joined to a hinge member of the joint at the shaft. An attachment for sweeping a hard, smooth floor can be engaged on the blade of the sweeping head. The attachment is a slotted bar with a felt blade extending outwardly of one edge. A direct pusher-puller implement having a short handle and short blade with serrated edge is detachably carried by the shaft of the sweeper.

3,624,856
APPLICATOR FOR USE IN SPREADING A SHAVING MATERIAL OR THE LIKE DISPENSED FROM A CONTAINER
William C. Bailey, 6704 N. Rockwell St., Chicago, Ill. 60645
Filed Dec. 4, 1969, Ser. No. 882,225
Int. Cl. A45d *27/02*
U.S. Cl. 15—210 **6 Claims**



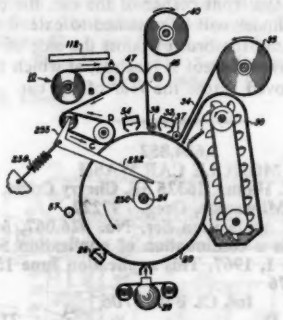
An applicator which has means formed at its upper end to permit it to be readily hung on an aerosol container and supported thereby and which when removed therefrom is used to spread the shaving material or the like dispensed from the aerosol container.

3,624,857
HEADLIGHT CLEANERS FOR VEHICLES
Walter Holzer, Meersburg, Germany, assignor to Holzer Patent AG, Zug, Switzerland
Filed Feb. 9, 1970, Ser. No. 9,719
Claims priority, application Germany, Feb. 14, 1969, P 19 07 601.8
Int. Cl. B60s *1/48*
U.S. Cl. 15—250.04 **5 Claims**



Apparatus for wiping the inclined cover plate of a parabolic headlight enclosure is mounted to a rotatable shaft, which extends perpendicularly through the cover plate and through the headlight enclosure and is also inclined to the light optical axis so that interference of the shaft with the light projected from a light source mounted at the geometrical focus of the headlight enclosure is reduced.

3,624,858
CLEANING APPARATUS
John A. Dimond, Pittsford, and Armistead Wharton, Henrietta, N.Y., assignors to Xerox Corporation, Rochester, N.Y.
Original application June 20, 1962, Ser. No. 647,411, now Patent No. 3,526,457, dated Sept. 1, 1970. Divided and this application Nov. 5, 1969, Ser. No. 871,251
Int. Cl. G03g *15/00*; A47l *13/40*
U.S. Cl. 15—256.5 **2 Claims**



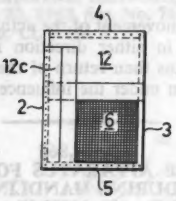
Apparatus for cleaning the surface on which electrostatic latent images are formed and developed. A web of fibrous material is advanced in constant linear increments into rubbing contact with the surface to be cleaned. A combination of loops in the web path enables cleaning two surfaces simultaneously utilizing both sides of the web.

3,624,859

SCREENING MEANS FOR CLEANING OR OTHER TREATMENT OF ARTICLES PERMEABLE TO AIR

Carl Tage E. Folke, Hagersten, Sweden, assignor to AB Vibrasug, Johanneshov, Sweden

Filed Feb. 20, 1970, Ser. No. 13,090
Claims priority, application Sweden, Apr. 9, 1969, 5,004/69
Int. Cl. A47l *5/38*
U.S. Cl. 15—307 1 Claim



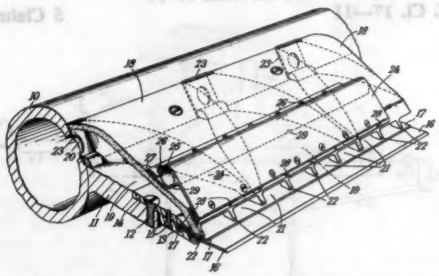
The present invention relates to means for cleaning or other treatment of articles permeable to air, such as carpets, rugs, bedding, articles of clothing and the like, by directing a flow of air through the goods spread out on a support frame or a bottom permeable to air. This support frame or bottom covers a polygonal, preferably rectangular or square opening communicating with a chamber through which air is flowing. Such a treatment may serve various purposes. Usually it is used to remove dust and/or to disinfect the goods. In the latter case the air serves as carrier for disinfectant which is finely distributed therein. According to the invention there is provided at least one masking sheet or web of at least substantially air-tight material tightly attached along one side edge to said support frame on bottom along one side of said opening, a bar extending along the opposite edge of said material so as to permit the masking sheet or web to be folded around said bar over said support frame or bottom to and from said attached side edge.

3,624,860

DOCTORS FOR PAPERMAKING MACHINES

Roger Anthony Grimston, Hemel Hempstead, and Alan Alfred Miles, Stoneleigh, England, assignors to Vickerys Limited, London, England

Filed Sept. 26, 1969, Ser. No. 861,410
Claims priority, application Great Britain, Oct. 1, 1968, 46,589/68
Int. Cl. B31f *1/14;* D21g *3/00*
U.S. Cl. 15—308 3 Claims



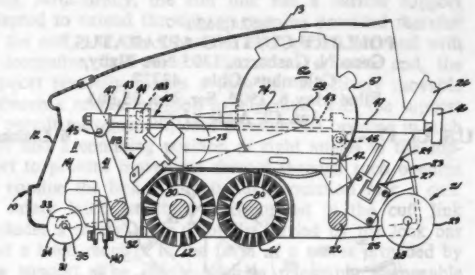
The invention provides a doctor for doctoring a roll of a papermaking machine, in which the support for the doctor blade includes a suction duct extending for the full length of the blade, contiguous suction nozzles extending forwardly from the suction duct to apply uniform suction to the blade, the nozzles providing a continuous wall extending rearwardly at a gradual inclination from the side of the blade remote from the roll, and an air blast duct mounted on the wall and having air blast nozzles situated between the suction nozzles and operative to discharge intermittently a substantially uniform flow of air towards the blade for the purpose of dislodging fuzz from the portions of the wall between the suction nozzles.

3,624,861

RUG SCRUBBER

Frederick E. Freiheit, Muskegon, Mich., assignor to Clarke Floor Machine Division, Studebaker Corporation, Muskegon, Mich.

Continuation of application Ser. No. 660,289, Aug. 14, 1967. This application Oct. 10, 1969, Ser. No. 866,147
Int. Cl. A47l *11/30*
U.S. Cl. 15—320 5 Claims



A portable rug scrubbing unit having scrubbing, foam generating and vacuuming assemblies incorporated directly therein. The driving motor has an elongated shaft upon which are mounted a vacuum impeller assembly, a pressure impeller assembly and a pulley for driving the cylindrical scrubbing brushes. The brushes rotate in opposite directions via a gear train and by selectively shifting the handle, the operator may shift the weight of the device from one to the other of the brushes, thus tending to move the machine rearwardly or forwardly. Liquid detergent is supplied to a former assembly located adjacent the brushes. The foamer assembly mixes prescribed amounts of detergent and air causing it to emit therefrom onto the brushes in the form of dry foam which, when worked into the carpet by the scrubbers, suspends dirt and other foreign particles therein. The vacuum squeegee is positioned forwardly of the brushes, permitting the operator to scrub during forward motion of the machine and vacuum finally during the rearward motion of the machine. Suitable valves are provided, of course, for deactivating the foamer during any desired period.

The foam and particles suspended therein are transferred via the suction impeller to a suitable receptacle positioned on the handle of the machine. It is understood that this abstract is not to be utilized to limit the scope of this invention.

3,624,862

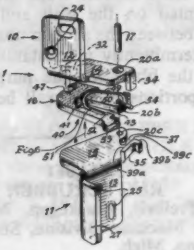
KNIFE HINGE LATCH

Carl H. Little, Jamestown, N.Y., assignor to Weber-Knapp Company, Jamestown, N.Y.

Filed Apr. 23, 1969, Ser. No. 818,490
Int. Cl. E05d *11/10*
U.S. Cl. 16—145 12 Claims

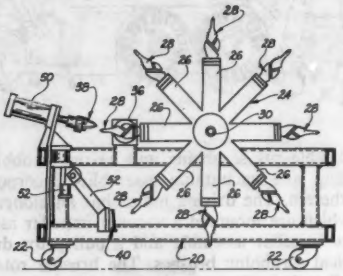
A knife hinge latch for attachment of a door to a cabinet including a pair of hinge parts mounted one on each of the door and cabinet and joined by a hinge pin,

a keeper carried on one of the hinge parts, and a strike-bearing member carried on the other of the hinge parts. The strike-bearing member cooperates with the keeper



to maintain the door in closed position, and serves as a bearing to facilitate pivotal movement between the hinge parts.

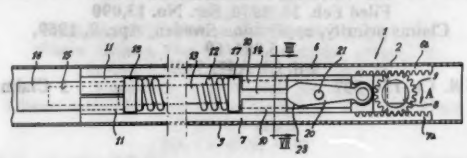
3,624,863
POULTRY CUTTING APPARATUS
Geno N. Gasbarro, 1305 Noe Bixby, Columbus, Ohio 43227
Filed May 8, 1970, Ser. No. 35,603
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **6 Claims**



An automatic poultry cutting apparatus which is adapted to sever a commercially dressed poultry body into several predetermined pieces for subsequent retail use and requires no manual handling of the body during the cutting operation. The apparatus includes a poultry retaining mandrel adapted to receive the dressed poultry body which is automatically advanced to a cutting station adjacent to a plurality of movably mounted cutting blades. The blades are synchronized with the advance of the mandrel to engage predetermined portions of the poultry body to sever the body into the predetermined number of pieces.

3,624,864
DOOR CLOSER
Eric Robert Marr, London, England, assignor to Brent Metal Works Limited, London, England
Filed Nov. 6, 1969, Ser. No. 874,657
Int. Cl. E05f *3/00*
U.S. Cl. 16—62 **4 Claims**

This invention relates to a door-closer mechanism (particularly for stackable double-swing doors) which comprises a turnably mounted actuating member, first and second thrust members connected to the actuating member to move in opposite directions when the actuating member turns in either direction from a rest position, and a coil spring engaged by the thrust members with its axis parallel to said opposite directions, whereby turning the turnable member in either direction from its rest position increases the stored energy of the coil spring. To control closing of the door damping means providing differential resistance to movement in two directions are

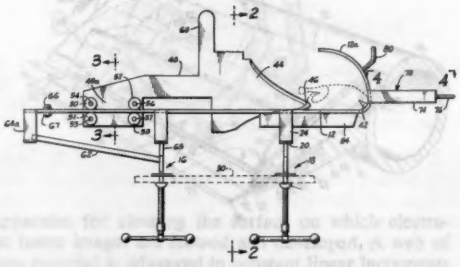


provided so that movement of the actuating member from its rest position in either direction is less damped by the damping means than return of the actuating member to its rest position under the influence of the coil spring.

3,624,865
HAND TYPE APPARATUS FOR QUIETING POULTRY DURING HANDLING THEREOF
Emery L. McDonald, 10395 Wunderlich Drive, Cupertino, Calif.
Filed Mar. 31, 1970, Ser. No. 24,272
Int. Cl. A22b *3/08*; A22c *21/00*
U.S. Cl. 17—11 **9 Claims**

For pacifying birds into a state of calm during handling thereof from coop or yard to conveyance and from the latter to hangers incident to slaughter, a hand worn finger ring vibrator having a leg engaging palm plate for transmitting vibrations from the apparatus to the leg of a bird gripped by a hand wearing such apparatus and including visual means for exciting the curiosity of such birds for lulling them into a state of tranquility to thereby minimize undue excitement and wing flapping and resulting injury and bruising to the birds as well as the handler wearing such apparatus.

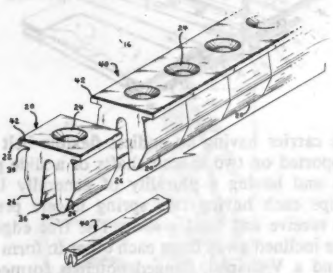
3,624,866
APPARATUS FOR BISECTING A FOWL
Leo Crappell, 102 Canal Drive, Franklin, La. 70538
Filed Dec. 9, 1969, Ser. No. 883,563
Int. Cl. A22c *21/00*
U.S. Cl. 17—11 **5 Claims**



The apparatus includes a base having a surface upon which the fowl to be bisected can be positioned and held against movement along the surface in one direction. A

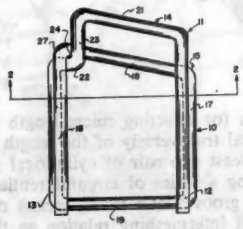
wedge-shaped knife blade is mounted for movement along the supporting surface with a portion of the blade extending into a longitudinally extending slot in the base. The forward, narrow end of the knife blade enters the vent of the fowl and bisects it as the blade moves parallel to the supporting surface.

3,624,867
PLASTIC LOCKING NUT IN STRIP FORM
Charles Edward Reynolds, Camp Hill, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Sept. 20, 1968, Ser. No. 761,063
Int. Cl. A44b *21/00*
U.S. Cl. 24—73 PF **5 Claims**



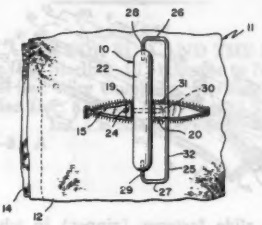
A plastic locking nut for fastening elements together is disclosed in strip form with a head portion of each of a series of nuts hinged to facilitate reeling of a strip of nuts and severing one nut from an adjacent nut for installation purposes. Each nut is provided with a cross-sectional configuration permitting the nut body to be formed essentially by extrusion with the nut including resilient legs operable transverse to the nut body in a sense accommodating extrusion tolerance and with the nut extrusion cut to provide its length dimension and thus made to a closer tolerance in such dimension. Each nut includes a slight recess between depending legs and the head portion to accommodate plastic scraped from the nut during installation.

3,624,868
SELF-LOCKING STRAP BUCKLE
Gert Somann, Centralia Industrial Park, Huron Park, Ontario, Canada
Filed Oct. 5, 1970, Ser. No. 77,926
Claims priority, application Canada, Nov. 17, 1969, 67,546
Int. Cl. A44b *11/00*; B65d *63/06*
U.S. Cl. 24—74 A **6 Claims**



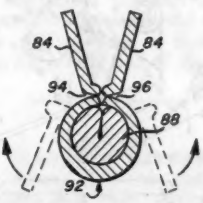
A wire buckle for web type strapping material is disclosed wherein the buckle maintains parallelism of the strap engaging arms. This is primarily achieved in the relationship by the formation of a notch by one of the bight members within which notch a distal leg is "locked" into position.

3,624,869
SAFETY LOCK CUFF LINK
Herman P. Filler, 1600 E. 41st St., Cleveland, Ohio 58424
Filed Sept. 8, 1970, Ser. No. 70,363
Int. Cl. A44b *1/18*
U.S. Cl. 24—90.5 **8 Claims**



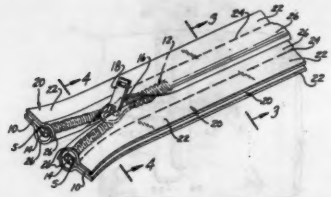
A cuff link for use with a shirt or blouse having French cuffs. Structurally, the cuff link has a narrow support adapted to extend through an opening provided therefor in the cuff, and the support is equipped at one end with a decorative face plate. Adjacent its opposite end, the support pivotally carries a lock bar selectively movable between a release position in alignment with the support to permit movement thereof through the opening in such cuff and a confining position at right angles to the support to prevent movement thereof through such opening to confine the link in functional association with a cuff. A safety latch structure incorporated in the cuff link includes a safety latch pivotally carried by the lock bar and a latch receiver in the form of a recess provided by the support. The safety latch is releasably engageable with the latch receiver to selectively constrain the lock bar against inadvertent movement thereof from its confining position in which it maintains the cuff link in functional association with a shirt cuff.

3,624,870
BINDING MAKING APPARATUS
David Scheff, 1376 Bretmoor Way, San Jose, Calif. 95129
Filed Oct. 9, 1969, Ser. No. 865,081
Int. Cl. A43c *9/04*; A44b *21/00*
U.S. Cl. 24—143 R **4 Claims**



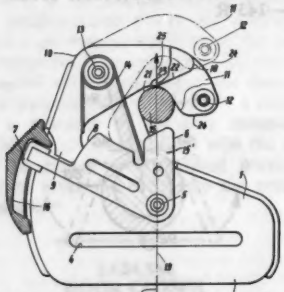
Apparatus for making selected lengths of bindings, such as shoelaces or the like, having end protective means disposed on the ends thereof comprising a long length of binding material having a plurality of ferrules disposed along the length thereof at spaced intervals. The ferrules are of a suitable length and cross section so as to be slidable along the binding material to selected positions and are deformable over the binding material so that when so deformed they will provide end protective means for a selected length of binding which may be cut from the binding material. Suitable deforming means are provided as a component part of the means for containing the lengths of the binding material.

3,624,871
COVERED SLIDE FASTENER
Frederick N. Osterkorn, 45 East End Ave., Neptune City, N.J. 07753
Filed May 8, 1970, Ser. No. 35,862
Int. Cl. A44b *19/34*
U.S. Cl. 24—205.1 5 Claims



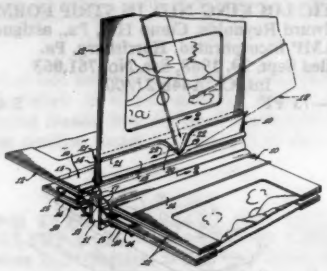
A covered slide fastener (zipper) in which the slide fastener elements (the coupling members) of each of a pair of cooperating stringers are covered by a cover element which extends over the slide fastener elements in the stringer, the cover element for each stringer being made of a resilient plastic material contoured or profiled to resiliently embrace the slide fastener elements on one side or face of such stringer. For a side and face and preferably for each side or face of the slide fastener, the cover elements of both cooperating stringers arrange themselves in mutually overlapping condition when the zipper is in closed condition. The slider of the slide fastener is movable in its zipper opening and closing operation fully embraced within the overlapping cover elements. The zipper thereby functions effectively as a snag-proof zipper.

3,624,872
SELF-LOCKING CATCH FOR ATTACHING A SAFETY BELT IN A MOTOR CAR
Arnold Bälder, Hamburg-Garstedt, Germany, assignor to Klippan G.m.b.H., Hamburg-Garstedt, Germany
Filed Sept. 11, 1969, Ser. No. 856,970
Claims priority, application Germany, Sept. 12, 1968, P 17 80 408.9
Int. Cl. H44b *13/00*
U.S. Cl. 24—241 4 Claims



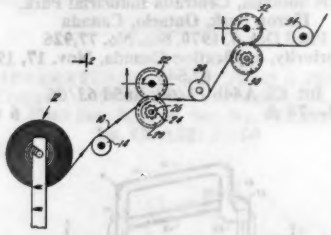
A self-locking catch for attaching a safety belt in a motor vehicle to a shackle comprises a bearing plate located between two side plates forming a casing, a spring-loaded retaining hook pivotably mounted on said bearing plate and a locking lever adapted to lock and release said retaining hook, an extension of said bearing plate having an edge on its underside comprising an arcuate portion for partly embracing said shackle and a straight portion adjoining said arcuate portion and extending below the retaining hook when the latter is in closing position.

3,624,873
SLIDE-HOLDING CLIP
Gerald J. Frey, 1834 Devon Road, Pasadena, Calif. 91103
Continuation-in-part of application Ser. No. 865,613, Oct. 13, 1969. This application Mar. 27, 1970, Ser. No. 23,230
Int. Cl. A44b *21/00*; G09f *11/14*
U.S. Cl. 24—259 FC 15 Claims



A slide carrier having an endless flexible belt adapted to be supported on two spaced shafts of a slide projector magazine and having a plurality of generally U-shaped spring clips each having two spring fingers pressed together to receive and hold a slide. The free edges of the fingers are inclined away from each other to form an entry mouth, and a V-shaped, flanged notch is formed in one finger, in alignment with an indentation in the other finger to receive the corner of a slide which spreads the fingers to facilitate insertion of the slide. Stop ribs are formed on both fingers to form a false bottom in the clip.

3,624,874
APPARATUS FOR STRETCHING FABRICS
Alfred E. Lauchenauer, Horn, Switzerland, assignor to Raduner & Co. A-G, Horn, Switzerland
Continuation of application Ser. No. 532,397, Mar. 7, 1966, which is a continuation-in-part of application Ser. No. 293,128, July 5, 1963. This application Nov. 18, 1969, Ser. No. 877,670
Claims priority, application Switzerland, July 6, 1962, 8,195/62
Int. Cl. D06c *3/06*
U.S. Cl. 26—63 1 Claim



In apparatus for effecting micro-length stretching of webs of material transversely of the length of said webs comprising at least one pair of cylindrical rolls, each of said rolls having a series of circumferentially extending axially spaced grooves and lands, means mounting said rolls in parallel intermeshing relation so that the lands of one roll extend into the grooves of the other roll in spaced relation thereto, adjustable means for moving the rolls radially relative to one another to establish the desired amount of extension of the lands into the grooves of the rolls, means gripping longitudinally extending spaced parallel zones of said web as the web moves between the nip of the rolls, and means for rotating said

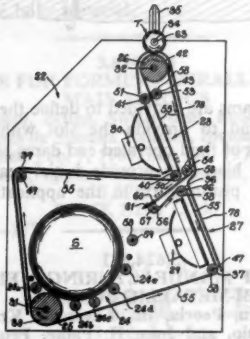
rolls at a predetermined angular rate in a direction to advance the web through the nip of the rolls to maintain a minimum tension on the web in a longitudinal direction, the distance between adjacent lands of each of said rolls being no greater than 1/10 the width of the web and said lands and grooves being in predetermined intermeshing relation to provide for a substantially uniform elongation of the web in a widthwise direction of at least 30% of the breaking elongation of the web material.

3,624,875

MACHINE FOR INSPECTING A WEB OF CLOTH

Peter Haft, Brooklyn, N.Y., assignor to Louis Pernick and David Pernick, fractional part interest to each

Filed June 5, 1969, Ser. No. 830,738
Int. Cl. D06h *3/04*
U.S. Cl. 26—70 1 Claim



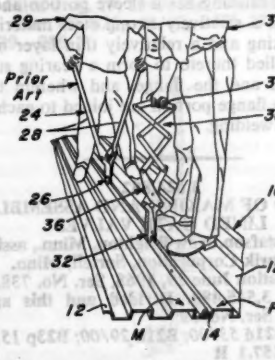
A machine for visually inspecting one or both sides of a web of cloth which is particularly adapted for inspecting tubular and open width fabric and is equipped with mechanism for automatically threading the web into the machine.

3,624,876

MANUALLY OPERATED LIP CLINCHING TOOL

Donald G. Irvin, East Burlington, Ontario, Canada, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Nov. 13, 1969, Ser. No. 876,536
Claims priority, application Canada, Dec. 10, 1968, 37,479, Patent 862,433
Int. Cl. B26f *1/36*
U.S. Cl. 29—21.1 5 Claims



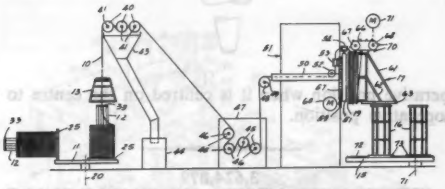
A manually operated lip clinching tool for clinching or dimpling interengaged connecting lips of adjacent building construction panels. The tool comprises a handle, pivotal jaw means, and contractable and extensible jaw operating means—in the form of a lazy-tong assembly—connecting the handle to the pivotal jaw means. The jaw operating means converts forced downward movement of the handle into forced pivotal movement of the jaw means in a clinching direction.

3,624,877

DESCALER FOR ROD AND THE LIKE

James F. Sanders, Sterling, Ill., assignor to Northwestern Steel and Wire Company, Sterling, Ill.

Filed Dec. 8, 1969, Ser. No. 883,039
Int. Cl. B21c *43/04*
U.S. Cl. 29—81 A 11 Claims



Descaling apparatus and system including a turntable at the incoming end of the apparatus carrying a series of reels for bundles of rod. A second turntable for a series of reels is at the delivery end of the apparatus. The reels on the first turntable are pivoted to move from a horizontal loading position to a vertical pay-off position and are indexed, as loaded with rod beneath a guide basket. Bundles of coiled rod are placed on a reel when in a horizontal position, and as placed thereon, the trailing end of one bundle is welded to the leading end of the next bundle. The reel being full, is raised to a vertical position and as rod is paid off one reel a next adjacent full reel is indexed beneath the guide basket and the rod is trained from the basket about a series of overhead scale breaker rolls, downwardly about a second series of scale breaker rolls and then through a rod layer, laying the rod on a descaler block. The descaler block has downwardly turned guide stakes extending therefrom over a reel on the second turntable. The rod is picked from the descaler block and advanced along the guide stakes onto a reel on the second turntable. The descaling operation is a continuous operation and when the rod on one reel on the first turntable is paid off, its trailing end is welded to the leading end of the rod on a second reel.

3,624,878

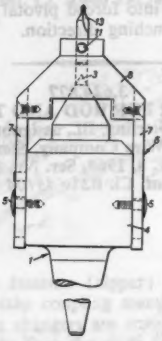
TOOLS FOR LATHES

Leonard Victor Barnett, Guilford, and George Nathan Drinkwater, Little Brookham, England, assignors to G. H. Drinkwater & Sons Limited

Filed Oct. 6, 1969, Ser. No. 864,045
Claims priority, application Great Britain, Oct. 9, 1968, 47,774/68
Int. Cl. B23b *29/00, 43/02*
U.S. Cl. 29—96 4 Claims

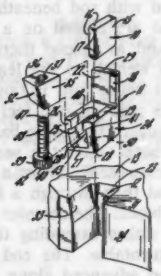
A tool carrier for mounting and centering a tool on a centre receivable by a tail stock or turret comprising a body portion and parallel arms extending therefrom, the body portion including a conical recess in which a conical portion on the centre bears when the tool carrier is centred on the centre and a tool socket coaxial with the recess, the carrier being pivotal on and axially movable relative to the centre by pins extending through longitudinally extending apertures adjacent the ends of the arms of the

carrier into the centre or a ring removably fixed round the centre, whereby the carrier can be moved from an



operative position when it is centred on the centre to an inoperative position.

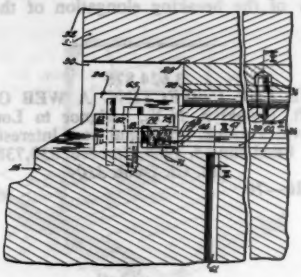
3,624,879
CUTTER WITH NESTED INDEXABLE BLADE CLAMPED BY SCREW ACTUATED WEDGE
James C. Ayer, Rockford, Ill., assignor to The Ingersoll Milling Machine Company, Rockford, Ill.
Filed Jan. 19, 1970, Ser. No. 3,687
Int. Cl. B26d *1/12*
U.S. Cl. 29—105 **7 Claims**



In the disclosed face milling cutter, square and indexable inserts of cutting material are clamped in cutting position between a wedge and an opposed wall of a body slot by inward drawing of a wedge during tightening of a screw threading only into the wedge and having a head whose underside, during tightening of the screw, presses against an abutment on a nest which provides a seat for locating the insert in its various indexed positions and is temporarily replaceably fixed in a slot of the cutter body by tack welds at opposite ends of the nest.

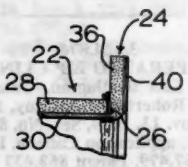
3,624,880
PISTON AND END DAM SEALING APPARATUS FOR ADJUSTABLE DEFLECTION ROLLS
Edgar J. Justus, Beloit, Alan R. Sorenson, Orfordville, and John Paul Turcotte, Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.
Filed June 8, 1970, Ser. No. 44,319
Int. Cl. B21b *13/14*
U.S. Cl. 29—116 R **25 Claims**

The piston for controlling deflection of a controlled deflection roll is disposed in an elongated slot in the center shaft of the roll and provided with metal sealing strips which are spring biased to be urged against the sidewalls of the elongate slot for initial sealing of the piston. A fluid passageway is provided in communication with shaped surfaces of the sealing strips to force the sealing strips against the adjacent walls of the elongate slot and the seating groove of the piston for the sealing strips.



A pair of end dams are provided to define the ends of the elongate slot and to provide the slot with a variable length by means of fluid operated end dams pistons which are also spring biased to provide initial sealing against the end of the piston prior to the application of fluid pressure.

3,624,881
METHOD OF MANUFACTURING A FLANGED BI-METALLIC BUSHING
Larry A. Brown, Peoria, Ill., Lavern J. Kracht, North Madison, Ohio, and John H. Paine, Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed June 8, 1970, Ser. No. 44,354
Int. Cl. B23p *11/00;* **B21d** *53/10;* **B23k** *27/00*
U.S. Cl. 29—149.5 **5 Claims**

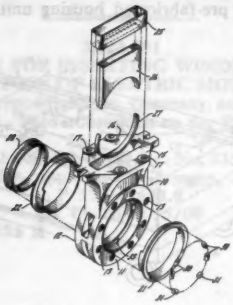


A bi-metallic bushing has a sleeve portion and a flange portion wherein a relatively strong steel material is provded as a backing and a relatively thin layer of bearing material is applied thereto to form a bearing surface for both the sleeve and the flange, and wherein the sleeve portion and the flange portion are joined to each other by inertia friction welding.

3,624,882
METHOD OF MAKING AND ASSEMBLING LINED GATE VALVES
Lloyd E. Gustafson, New Brighton, Minn., assignor to Dezurik Corporation, Sartell, Minn.
Original application June 19, 1968, Ser. No. 738,347, now Patent No. 3,545,480. Divided and this application Jan. 2, 1970, Ser. No. 39
Int. Cl. B21d *53/00;* **B21k** *29/00;* **B23p** *15/26*
U.S. Cl. 29—157.1 R **6 Claims**

A method of fabricating a lined gate valve is disclosed in which a sleeve opening cast within the valve body member is used as a reference for final machining both

the valve throat and valve seat. Preformed throat and sleeve liner sections are fabricated to form a continuous



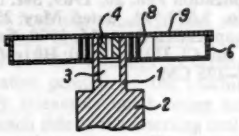
corrosion-resistant inner surface contiguous with and supported by the body material.

3,624,883

PROCESS FOR FORMING SPIRALLY WOUND MAIN SPRINGS

Thomas Baehni, Brugg, Switzerland, assignor to Societe des Fabriques de Spiraux Reunies, Bienne, Switzerland

Filed Feb. 7, 1969, Ser. No. 797,456
Claims priority, application Switzerland, Feb. 8, 1968, 1,876/68
Int. Cl. B23p *13/00*
U.S. Cl. 29—177 **7 Claims**



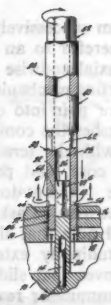
A process for forming a spirally wound main spring comprises securing one end of a strip of spring material to a timepiece collet and then rotating the timepiece collet relative to the other end of the spring strip to spirally wind same into a main spring. During rotation of the collet, the wound coils of the spring are restrained from radially separating from one another and after the spring is fully wound, the spring is relaxed and the coils are allowed to radially separate. The relaxed spring may then be subjected to a thermal treatment to heat-set the spring.

3,624,884

TRANSMISSION REPAIR TOOL

Emilio Scime, 919 65th Ave., Brooklyn, N.Y. 11223

Filed Aug. 19, 1969, Ser. No. 860,143
Int. Cl. B23p *19/00*; B25b *27/06*
U.S. Cl. 29—200 P **12 Claims**



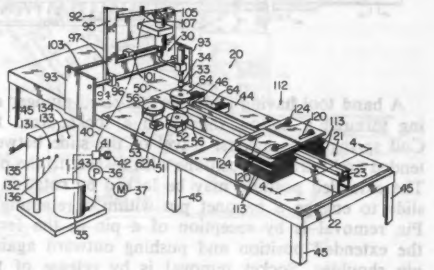
A bore, such as a governor bore in a transmission housing, is repaired by employing a first tool for burnishing and enlarging the bore and a second tool for installing a bushing in the enlarged bore so as to restore the bore to its original diameter. Each of the tools is aligned within the bore when in use by means of an alignment guide which is mounted in the axis of the bore and which slidably engages the tool.

3,624,885

APPARATUS FOR MAKING A THERMALLY INSULATING JOINT CONSTRUCTION AND AN ADJUSTABLE GUIDE ASSEMBLY FOR USE THEREWITH

William H. Holliday, Bon Air, and Layle B. Barker, Richmond, Va., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 17, 1969, Ser. No. 877,212
Int. Cl. B23p *17/00, 19/00*
U.S. Cl. 29—200 A **27 Claims**



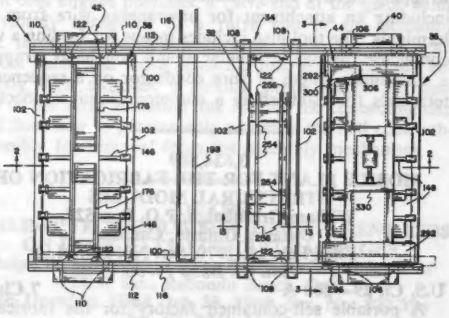
A head assembly having a nozzle for dispensing a thermal insulating material is supported at a dispensing station and a dual-purpose device is provided and used for supporting and moving straight rigid members in a rectilinear path past the dispensing station so that an open channel in each member may be filled by gravity with the thermal insulating material. A guide assembly is also provided and adjusted so that members of irregular cross-sectional configuration may be easily guided along the rectilinear path.

3,624,886

APPARATUS FOR ASSEMBLING A WORKPIECE

Joseph E. Powers and Alfred F. Bastian, Napa, Calif., assignors to Kaiser Steel Corporation, Oakland, Calif.

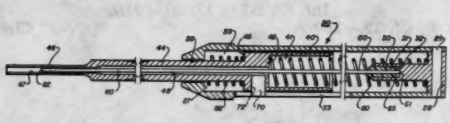
Original application Mar. 27, 1967, Ser. No. 626,111, now Patent No. 3,507,024, dated Apr. 21, 1970. Divided and this application Nov. 24, 1969, Ser. No. 877,593
Int. Cl. B23p *19/00, 17/00*
U.S. Cl. 29—200 J **28 Claims**



An apparatus for assembling a workpiece, especially a modular workpiece, wherein a group of elements of

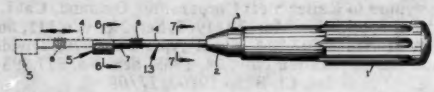
the workpiece is oriented in predetermined angular and spaced relationship in one location; wherein these elements, with their angular and spaced relationship under control, are transferred as a group to another location where they are assembled in said predetermined relationship with another element of the workpiece; and wherein the assembled elements are interconnected.

3,624,887
PIN AND SOCKET REMOVAL TOOL
Wolfgang Hilbert, Holzkirchen, Germany, assignor to The Bunker-Ramo Corporation, Oak Brook, Ill.
Filed Mar. 2, 1970, Ser. No. 15,382
Int. Cl. B23p *19/00;* **B25b** *27/02;* **H01r** *3/00*
U.S. Cl. 29—203 H **12 Claims**



A hand tool having a slender pin-sized plunger extending through a hollow slide with a socket-sized ferrule. Coil springs bias against travel of the slide between extended and retracted positions with respect to the plunger. The extended position may be locked by rotation of the slide to engage a bayonet pin within a retaining J-slot. Pin removal is by reception of a pin in the ferrule at the extended position and pushing outward against the pin shoulder. Socket removal is by release of the extended position and insertion of the plunger for pushing at the bottom of the socket, the ferrule retracting along the plunger and providing protection and compressive bracing thereof.

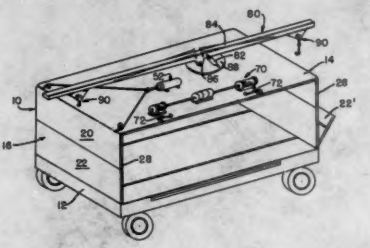
3,624,888
TOOL FOR WRAPPING AND REMOVING CONDUCTORS FROM TERMINALS
Arthur S. Kester, Chicago, Ill., assignor to Rauland-Borg Corporation, Chicago, Ill.
Filed July 20, 1970, Ser. No. 56,492
Int. Cl. H01r *43/04;* **H05k** *13/00*
U.S. Cl. 29—203 H **4 Claims**



A hand tool with an adjustable tubular shank for wrapping electric wire conductors onto electric terminals including an attachment for unwrapping wire from the terminals. The tool also includes means for feeding a wire conductor through a tubular shank and hand wrapping a continuous length of wire conductor on a sequence of terminals for establishing a common circuit connection.

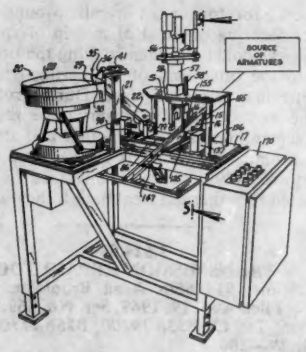
3,624,889
MOBILE PLANT FOR THE FABRICATION OF STRUCTURAL MODULES
William Greenhalgh, P.O. Box 521, Oshawa, Ontario, Canada
Filed Feb. 12, 1970, Ser. No. 10,754
Int. Cl. B23p *19/00*
U.S. Cl. 29—200 A **7 Claims**

A portable self-contained factory for the fabrication and erection of structural modules comprising a housing provided with ground traversing support means and wherein the housing provides means for the storage and dispensing of at least framing studs and construction board panels to facilitate the fabrication of at least modular construction panels such as suitable for the production of pre-fabricated housing units. The portable



factory is additionally provided with ancillary means for the handling of modules produced to erect and dismantle structures consisting of panels produced by the utilization of the factory.

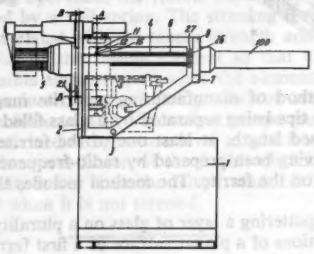
3,624,890
MACHINE FOR AUTOMATICALLY ASSEMBLING ARMATURE CORES AND COMMUTATORS THEREFOR
Thomas L. Schuette, Osseo, Melvin J. Straub, Minnetonka, and Pierre Dumas and Peter F. Aurich, Minneapolis, Minn., assignors to Possis Machine Corporation, Minneapolis, Minn.
Original application Feb. 20, 1969, Ser. No. 801,084, now Patent No. 3,579,771, dated May 25, 1971. Divided and this application Sept. 16, 1970, Ser. No. 72,576
Int. Cl. H02k *15/00;* **H01r** *43/06*
U.S. Cl. 29—205 CM **13 Claims**



Feeding mechanism successively brings armature cores and commutators therefor to an assembly station where they are held in coaxial endwise spaced relationship and where rotation imparting mechanism brings each armature core and commutator pair into correct angular relationship. A ram then pushes the commutator axially towards the armature core with the terminal tangs on the commutator facing the core, and presses it onto the shaft thereof, moving the commutator through a die which straightens tangs that may be askew. The tang straightening die has a round hole that slidably accepts the commutator, and longitudinally extending circumferentially spaced parallel grooves that slideably accommodate the tangs. When the commutator reaches proper position on the armature shaft, and while still in the die, a tang shaping member having circumferentially spaced parallel fingers, one for each tang, telescopes over the commutator,

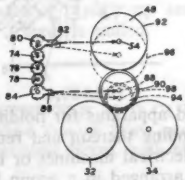
each finger moving along one of the grooves to engage under the tang therein and lift it into contact with the bottom of the groove.

3,624,891
MACHINE FOR INSERTING WINDINGS INTO STATORS OF ELECTRIC MOTORS
Hans Droll, Bergen-Enkheim, Germany, assignor to Balzer & Droll KG., Niederdorfelden an der Rosenhelle, Germany
Filed June 23, 1969, Ser. No. 835,704
Claims priority, application Germany, July 9, 1968, P 17 63 641.8
Int. Cl. H02k *15/04*
U.S. Cl. 29—205 R 8 Claims



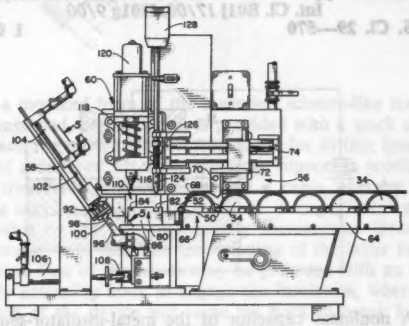
A machine for inserting windings into stators of electric motors and like machines which is provided with an insertion tool for the windings so arranged as to be held in its operative position in the machine frame by means of readily releasable quick-acting locking means disposed one on each side of the inserting tool and adapted on release to allow the tool to be lifted bodily out of the machine frame. The tool may be provided with lifting lugs adapted to receive the load hook of a crane. Locking means for the rear end, which may be telescopically formed with respect to the front end, may also be provided. If the tool, as is known, is provided with a rotatable ratchet disc held in position by a pawl engaging one or other of its teeth, means are provided for moving the pawl out of its engaged position.

3,624,892
APPARATUS FOR STRIPPING FLEXIBLE TUBES FROM MANDRELS
Levi Monteiro, Plymouth, Mass., assignor to Armstrong Cork Company, Lancaster, Pa.
Filed Aug. 1, 1969, Ser. No. 846,888
Int. Cl. B23p *19/02, 17/04*
U.S. Cl. 29—235 8 Claims



An apparatus for stripping flexible tubes from mandrels on which they are cured. The bond at the interface between the tube and the mandrel is broken by injecting a liquid at high pressure into the interface while simultaneously massaging the outer surface of the tube. Once the bond is broken, it is possible to axially displace the mandrel with a pneumatic ram.

3,624,893
METHOD OF FINALLY ASSEMBLING BALL COCK GUIDE AND FLOAT SUBASSEMBLY
Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631, and Fredric E. Schmuck, 535 Century Drive, Anaheim, Calif. 92805
Filed Feb. 19, 1970, Ser. No. 12,783
Int. Cl. B23p *19/00;* B23q *7/10*
U.S. Cl. 29—429 20 Claims



A supply of ball cock floats are moved or fed consecutively by a vibrating supply bowl into a feed track and consecutively therealong to an assembly transfer station, with a supply of connecting clips being similarly moved or fed consecutively to a separated assembly transfer station, both the floats and connecting clips arriving and being retained at their respective transfer stations particularly positioned for following transfer operations. During a transfer operation preceding each assembly operation, a linearly movable float transfer arm engages each float at the transfer station and pushes that particular float to an assembly station float holder, while at the connecting clip transfer station a feed plunger moves a clip into a pivotal transfer arm mounted clip holder, the transfer arm subsequently pivotally moving the clip holder to its assembly station. In the respective assembly stations, the clip, U-shaped in configuration, has telescoped a float boss and is held aligning clip leg portion and float boss openings. An operator then simultaneously inserts a float end of a rigid guide through a guide opening of the float and a float end of a valve actuating link through the connecting clip and float boss aligned openings, a valve end of the guide being previously connected to a valve end of the actuating link through a valve control arm. Upon the float ends of the guide and valve actuating link simultaneously engaging limit switches, a staking punch stakes the float end of the valve actuating link beyond the connecting clip and float boss to permanently assemble the ball cock subassembly for removal from the assembly mechanism.

3,624,894
SEALING TECHNIQUE FOR TRANSPARENT LIDS ON INTEGRATED CIRCUIT PACKAGES
Ralph W. Miller, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.
No Drawing. Filed Oct. 29, 1969, Ser. No. 872,396
Int. Cl. B23k *31/02*
U.S. Cl. 29—473.1 2 Claims

Where thin film resistors in an integrated circuit require laser adjustment, an optically true transparent lid is

hermetically sealed to the base flatpack. The lid is vapor plated with chromium in a predetermined pattern followed by a coating of gold. A hermetic seal which maintains its integrity under moderate thermal shock conditions is formed by soldering to the flatpack.

3,624,895

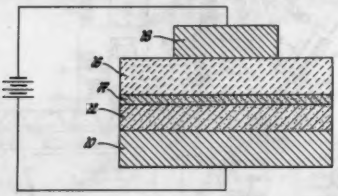
METAL-INSULATOR-SEMICONDUCTOR VOLTAGE VARIABLE CAPACITOR WITH CONTROLLED RESISTIVITY DIELECTRIC

Bernard A. MacIver, Lathrup Village, and Matthew C. McKinnon, Warren, Mich., assignors to General Motors Corporation, Detroit, Mich.

Original application Nov. 11, 1968, Ser. No. 697,228, now Patent No. 3,512,052, dated May 12, 1970. Divided and this application Nov. 28, 1969, Ser. No. 880,711

Int. Cl. B01j 17/00; H01g 9/00

U.S. Cl. 29—570 1 Claim



A nonlinear capacitor of the metal-insulator-semiconductor type in which inversion of the semiconductor at the insulator-semiconductor interface is prevented. A surface varactor is described in which the insulating layer has a selected moderate resistance and is of a high permittivity dielectric. The specification discloses forming such insulating layers by reactive sputtering.

3,624,896

METHOD OF MAKING AN ELECTRICAL MOVING COIL DEVICE

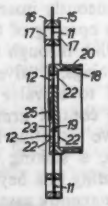
Roger Giles Daubeney, Charlton Kings, and Anthony George Lithgow Shore, Winchcombe, England, assignors to Dowty Technical Developments Limited, Brockhampton, England

Filed June 23, 1969, Ser. No. 835,684

Claims priority, application Great Britain, June 26, 1968, 30,403/68

Int. Cl. H02k 15/00

U.S. Cl. 29—596 8 Claims



A spring mounting for an electrical moving coil device comprising a plurality of metallic spring blades extending from a fixed support to the moving coil carrying member to locate the moving coil carrying member and the moving coil for reciprocation in a magnetic field, the said spring blades also serving as electrical connections for coil. The moving coil device may form part of a force motor for use in a pressure regulating valve forming part of an electro-hydraulic or electropneumatic servo-valve.

3,624,897

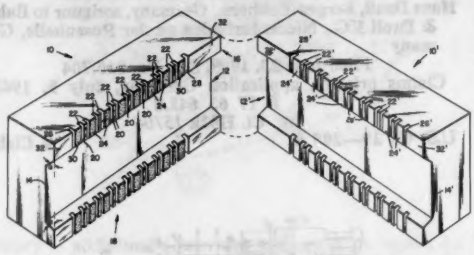
METHOD OF MAKING A FERRITE HEAD

Franklin G. Reade, Monrovia, and Tazzell Smith, Los Angeles, Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed July 25, 1969, Ser. No. 844,851

Int. Cl. H01f 7/06

U.S. Cl. 29—603 7 Claims



A method of manufacturing a ferrite magnetic head, the pole tips being separated by a glass-filled gap of predetermined length, at least one of the ferrite-glass interfaces having been prepared by radio-frequency sputtering of glass on the ferrite. The method includes the following steps:

(1) sputtering a layer of glass on a plurality of selected portions of a planar surface of a first ferrite member;

(2) applying a layer of a refractory material on other portions of said surface alternating with said selected portions, said layer of refractory material having a thickness equal to the desired gap length; and

(3) fusion bonding said layer of glass to a planar surface of a second ferrite member while said layer of refractory material is maintained in contact engagement with said surface of said second member.

3,624,898

METHOD AND APPARATUS FOR HANDLING A FORMER

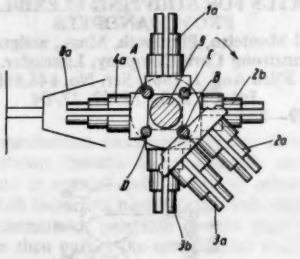
Hans Droll, Bergen-Enkheim, Germany, assignor to Balzer & Droll KG., Niederdorfelden an der Rosenhelle, Germany

Filed Oct. 22, 1969, Ser. No. 868,482

Claims priority, application Germany, Apr. 17, 1969, P 19 19 432.2

Int. Cl. B21f 3/00; H01f 7/06

U.S. Cl. 29—605 15 Claims



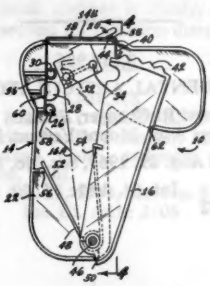
A method and apparatus for holding and moving formers during winding thereon and removal therefrom of wire coils for electrical machines or the like. A plurality of formers are arranged in a group lying in a common plane and extending outwardly from a central axis perpendicular to said plane. As the formers move about the central axis the formers move at least to a winding position where they are wound and to a removal position where at least one former of the group is swiveled to be parallel to another former of the group for simultaneous removal of

the coils from the two parallel formers. There may be more than one group of formers, the planes of the other groups being parallel to the plane of the first mentioned group and all groups sharing the same central axis.

3,624,899
METHOD OF MAKING VACUUM FUSE
Sidney R. Smith, Jr., Myrtle Beach, S.C., assignor to General Electric Company
Original application Apr. 24, 1968, Ser. No. 723,695, now Patent No. 3,510,819, dated May 5, 1970. Divided and this application Nov. 6, 1969, Ser. No. 871,260
Int. Cl. H01h *69/02*
U.S. Cl. 29—623 2 Claims

A vacuum fuse manufactured by sealing a fusible element within an evacuated envelope while the envelope is subjected to a relatively high temperature. Subsequent to the sealing operation, the fusible element is mechanically stressed by a coil spring. The stressing force of the spring is correlated with the tensile strength and thermal characteristics of the fusible element so that this force pulls the fusible element apart when the element's tensile strength is reduced, by the heating effect of overcurrent through the fuse, to a predetermined temperature level. The predetermined tempearture level at which such rupture and subsequent fusion of the fusible element occurs is substantially lower than the temperature of fusion of the element when it is not stressed.

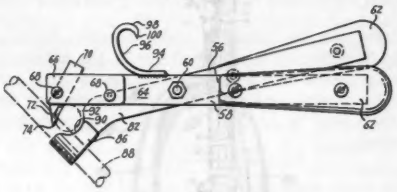
3,624,900
SAFETY SCISSORS
Denis V. Bosley, Palos Verdes Peninsula, Henry J. Folson, Redondo Beach, and John W. Ryan, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Nov. 26, 1969, Ser. No. 880,006
Int. Cl. B26b *13/08*
U.S. Cl. 30—234 4 Claims



A scissors-type device for cutting a paper comprising a first rigid shearing member fixed to a housing and a second shearing member mounted to oscillate relative to the first member. A trigger mounted on the housing has a wavy upper portion that engages the second shearing member to move it rapidly up and down a small distance when the trigger is pulled.

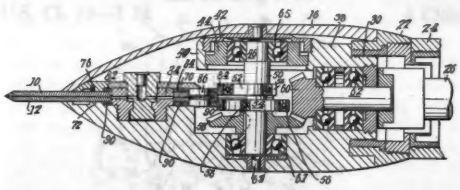
3,624,901
WIRE STRIPPER AND CUTTER
Walter G. Pettit, 8264 Tanoak Way, and Walter W. McCurry, 7812 Rosswood Drive, both of Citrus Heights, Calif. 95610
Continuation-in-part of application Ser. No. 811,497, Mar. 28, 1969. This application Aug. 26, 1969, Ser. No. 857,280
Int. Cl. H02g *1/12*
U.S. Cl. 30—90.4 2 Claims

An operating handle, functioning as a lever, is provided with a hand grip at one end and a knife at the other end, and a work support in the form of a hook adapted to engage an insulated cable or the like is pivotally connected to the handle lever. The lever is operable to cause the knife to cut into and through the insulation of the cable, and after this has been done, the cable can be removed from the hook and the latter swung to an inoperative position to permit the knife to be used independently for stripping the wire or wires.



In a modified form of the invention scissors-like levers are employed, one of which is provided with a work support and the other with a cutting knife for slitting insulation of a cable or wire, and the work support is provided with transverse grooves to support a cable whereby the device may be rotated with the knife in engagement with the cable to cut circumferentially therearound through the insulation to facilitate the stripping of the latter from the wire. One of the levers may be provided with an upwardly extending hook to engage the insulation, whereby rotation of the device will cause the hook to break loose the insulation from the wire.

3,624,902
KNIFE FOR SKINNING HIDES
Franklyn G. Umholtz, Shutesbury, Mass., assignor to Russell Harrington Cutlery Corporation, Southbridge, Mass.
Filed Nov. 13, 1969, Ser. No. 876,292
Int. Cl. B26b *19/12*
U.S. Cl. 30—220 6 Claims

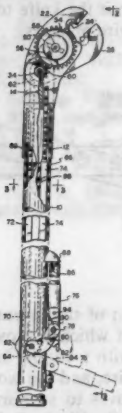


A power operated knife for dehiding, of the type utilizing a pair of counter-oscillating circular toothed blades in close association, wherein said blades are provided with generally radial openings, each opening receiving a cam mounted on a shaft and rotated by power means, said cams rotating out of phase with each other; and including keys each having a yoke for the reception of said cams individually and in conjunction with the edges of the radial openings in the blades. A unitary main frame for containing and holding the blades, cams, and the power mechanisms, gear box, etc.

3,624,903
CUTTER FOR ENERGIZED POWER LINES
James W. Tibbet, Rte. 1, Box 94, Gold Hill, Oreg. 97525
Filed Aug. 26, 1969, Ser. No. 853,082
Int. Cl. B26b *13/26*
U.S. Cl. 30—238 7 Claims

A cable cutting tool for energized power lines having a fixed cutting head mounted on one end of an elongated

handle and a movable cutting head attached to the fixed cutting head. Cam means are provided to rotate the movable cutting head both laterally and longitudinally of the fixed cutting head to subject a cable placed between



the heads to a combined compression and shearing cutting action. A linkage disposed within the body of the tool provides the necessary mechanical advantage to the cam means.

3,624,904

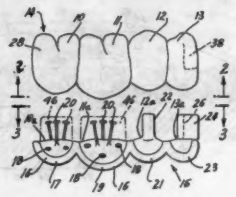
TEMPLATE FOR IMPLANT DENTURE

Leonard I. Linkow, 30 Central Park S., New York, N.Y. 10019

Filed May 10, 1968, Ser. No. 728,304

Int. Cl. A61c *13/00*

U.S. Cl. 32—10 A 23 Claims



In order to implant a fixed bridge into a patient's mouth when no teeth are present or large edentulous spaces exist with only a few teeth left, a template is formed having a configuration corresponding to the contour of the gum and bone structure, as well as the contour of the teeth that will form the superstructure in the area of the mouth in which the prothesis is to be placed. Securing elements at the tooth area are passed through the template into the bone structure and a plurality of projections are provided on the template adjacent the securing elements. Tooth supports are formed around those projections and securing elements. The template may also have a vertical post projecting therefrom which, like said tooth supports, is adapted to be snugly received within a mating recess in the denture. Said post may cooperate with the denture in precision attachment fashion, and a gingival shoulder may be provided on the template to provide further support for the artificial tooth structure and to prevent contact of the denture with the gum tissue.

3,624,905

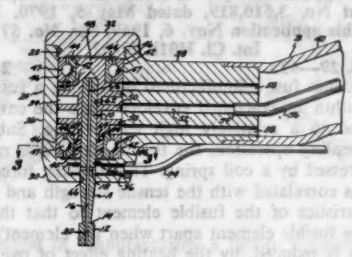
WATER-COOLED DENTAL CUTTING MEMBER AND HANDPIECE FOR USE THEREWITH

James B. Barsby, 6477 Atlantic Ave., Long Beach, Calif. 90805

Filed Feb. 4, 1970, Ser. No. 8,639

Int. Cl. A61c *1/10*

U.S. Cl. 32—27 3 Claims



A water-cooled dental cutting member that may be used for cutting, grinding, or drilling, depending upon the configuration of the tooth-contacting portion thereof, and a turbine-type dental handpiece that is particularly adapted for removably supporting the cutting member, as well as supplying a constant flow of cooling water thereto. The turbine rotor in the handpiece operates within a confined space that is at a substantially higher air pressure than the pressure of the cooling water. Accordingly, cooling water has no tendency to enter that portion of the handpiece in which the rotor is supported to slow down the rate of rotation of the rotor or stop the rotor by frictional contact therewith.

3,624,906

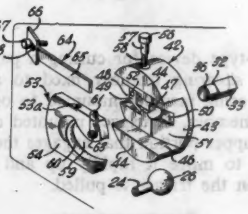
DENTAL ARTICULATOR

Ernest R. Granger, Pelham, N.Y. (149 Prospect Ave., Mount Vernon, N.Y. 10550)

Filed Aug. 29, 1969, Ser. No. 854,152

Int. Cl. A61c *11/00*

U.S. Cl. 32—32 7 Claims



A dental articulator provided with an adjustable Bennett movement includes a pair of longitudinally spaced adjustable post-mounted, condyle-defining spherical bearings. A longitudinal shaft provided with a forwardly projecting mounting member terminates at opposite ends in longitudinally adjustable yokes which pivotally support condyle path members for rocking about vertical axes, the condyle path members having horizontal condyle tracks which engage respective condyles. A Bennett guide member is adjustably mounted on each yoke for limiting

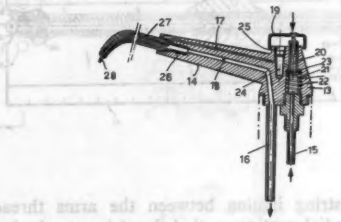
the lateral excursion of the shaft relative to the condyles and screws carried by the yoke in the path of the condyle path members adjustably limit the angular rocking thereof.

3,624,907

DEVICES FOR THE RATIONAL WASHING OF TOOTH ROOT CANALS WITH SIMULTANEOUS SUCTION OF THE OUTFLOWING LIQUID AND RELATED IMPROVED DEVICES

Michele Brass and Ennio Brass, both of Via Paris Bordone 11, Milan, Italy

Filed June 5, 1969, Ser. No. 830,694
Claims priority, application Italy, June 6, 1968, 17,416/68
Int. Cl. A61c 3/00
U.S. Cl. 32—40 9 Claims



This invention relates to an improvement in devices used in treatment of teeth, particularly in work on root canals. The device serves to supply a stream of fluid for the purpose of washing out the root canal or treating it with a medicament and also is connected to a vacuum force so that the fluid can be removed as rapidly as it is supplied. The head of the device, consisting of one tube with clearance inside another is sturdy, but yet is small enough in cross-section for insertion directly into the root canal.

3,624,908

AUTOMATIC DENTAL STRIPPER INSTRUMENT

Robert M. Ricketts, Pacific Palisades, and John Donald Tichenor, Tarzana, Calif., assignors to Dome, Inc., Pacific Palisades, Calif.

Filed Jan. 26, 1970, Ser. No. 5,626
Int. Cl. A61c 3/06
U.S. Cl. 32—58 2 Claims

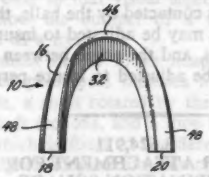
An improved dental tool is provided which imparts reciprocating movement to an abrasive or polishing strip, saw or the like, and which may be used for polishing fillings, or separating, excising and cleaning teeth, or for other appropriate dental stripping purposes. The tool includes a handle which encloses an electrically powered socket, the socket being adapted removably to receive the shank of a disposable plastic frame in which the abrasive strip, or equivalent element, is releasably mounted. A rechargeable battery power source may also be housed within the handle.

3,624,909

TEETH GRIPPING MEDICAMENT APPLICATOR FOR TREATMENT OF TEETH AND/OR GUMS

Samuel Greenberg, Stump Road and Commerce Drive, Montgomeryville, Pa. 17754

Continuation-in-part of application Ser. No. 662,114, Aug. 21, 1967, now Patent No. 3,527,219. This application May 26, 1970, Ser. No. 40,621
Int. Cl. A61c 3/00
U.S. Cl. 32—40 7 Claims



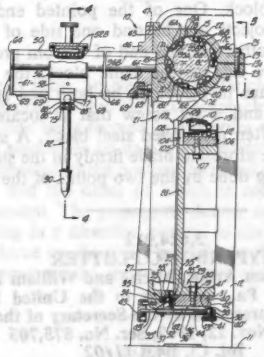
An applicator for the treatment of teeth and/or gums with fluorides or other medicaments wherein the applicator comprises a flexibly resilient substantially horseshoe-shaped liquid-impermeable tray of channel cross-section and a medicament carrier substantially coextensive therewith and also of channel cross-section secured in the tray, the inner and outer flanges at the anterior teeth being inclined distally or inwardly while the inner and outer flanges at the posterior teeth converge towards the teeth so that when the applicator is applied to the teeth it will readily accommodate to and grip the teeth without springing off, and when moderate pressure is applied to the applicator the medicament will invest the teeth and/or gums.

3,624,910

MULTIAXIS INSPECTION SYSTEM

Clair L. Farrand, Bronxville, N.Y., assignor to Inductosyn Corporation, Carson City, Nev.

Filed Aug. 27, 1969, Ser. No. 853,237
Int. Cl. B43l 5/00
U.S. Cl. 33—1 M 4 Claims

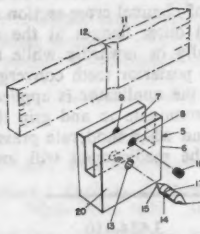


A bearing arrangement for the movable carriages of a multiaxis inspection system comprising first and second mutually orthogonal shafts; first and second carriages, the second shaft being secured to the first carriage; bearing means for supporting the first and second carriages for movement relative to the first and second shafts, respectively, the bearing means for each of the carriages comprising first and second sets of recirculating balls which

contact the shafts at a plurality of points along two lines on opposite sides of the circumference thereof above the longitudinal axes; and constraint, slide bearing means spaced from and below the shafts for preventing rotation of the first and second carriages about the longitudinal axes of the first and second shafts, respectively. The sets of recirculating balls and the constraint, slide bearing means form three-point supports for the carriages. The second carriage supports a probe for movement along an axis which is orthogonal to the axes of the first and second shafts.

The shafts may be rotated in order to select the location of the two lines contacted by the balls, the constraint, slide bearing means may be adjusted to insure linear motion of the carriages, and the angle between the first and second shafts may be adjusted to insure perpendicularity therebetween.

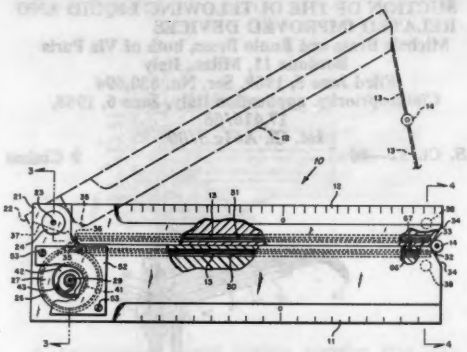
3,624,911
SCRIBER ATTACHMENT FOR A COMBINATION SQUARE
Bernard D. Max, 312 Circleview Drive S., Hurst, Tex. 76053
Filed Apr. 10, 1970, Ser. No. 2,316
Int. Cl. B43l *13/02*
U.S. Cl. 33—42 **2 Claims**



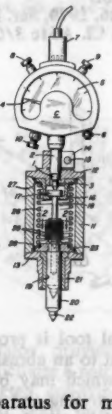
This invention relates to hand tools and consists of a rectangular steel block having an elongated U-shaped recess therein in which is placed the blade of a combination square after a steel pin, having a point at each end thereof, is placed in centrally located openings in the aforesaid steel block. One of the pointed ends of the aforesaid pin projects out beyond one side of the steel block while the other pointed end of the pin projects out beyond the other side of the same block, the steel pin being held in place in the block by both one end of the aforesaid blade and a set screw that is located in the bottom of the often mentioned steel block. A second set screw secures the aforesaid blade firmly in the steel block, the scribing being done by the two points of the steel pin.

3,624,912
HYPERBOLIC PLOTTER
Paul R. Voss, Ann Arbor, Mich., and William E. Burns, Jr., Chalfont, Pa., assignors to the United States of America as represented by the Secretary of the Navy
Filed Nov. 12, 1969, Ser. No. 875,705
Int. Cl. B43l *11/02*
U.S. Cl. 33—27 H **11 Claims**

A portable drafting instrument for plotting hyperbolas foldable into a rectangular rule-like configuration comprising a pair of arms each having longtudinally extending channels through which is threaded a respective end of a pencil or pen guide-carrying string and each having a tab projecting from one end thereof to which is pivotally connected that of the other to permit registration of ports at the free ends of the arms from which the string issues with hyperbola foci. The string ends are connected to a spool mounted for rotation about an arbor fixed to one of the arms coaxially of a spool receiving cavity against or under the action of an interior helical spring. The guide comprises a tubular cylinder terminating in spaced apart, radially projecting flanges and has the portion of the string issuing between the arms threaded through its medial portion so that the string can be internally crimped by insertion of a pencil or pen point therethrough for retaining the guide in a substantially fixed, eccentricity determining position relative to the string.



3,624,913
METHOD AND APPARATUS FOR MEASURING DIFFERENTIAL MAGNITUDES
Valerio Ciampolini, Milan, Italy, assignor to Industrie Pirelli S.p.A., Milan, Italy
Filed Apr. 9, 1970, Ser. No. 26,956
Claims priority, application Italy, Apr. 14, 1969, 15,530/69
Int. Cl. G01b *5/00*
U.S. Cl. 33—172 R **20 Claims**



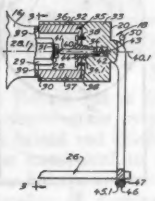
A method and apparatus for measuring differential magnitudes between two predetermined limit values with a comparator the method comprising a first measuring of the surface of the object under study to calibrate the comparator so that the selected limit value from which the differential will be measured coincides with the predetermined base value and then conducting a second measuring to determine the differential of the surface from

the selected limit value; the apparatus comprising three sensing elements operatively connected to the comparator, two of the elements normally being held against relative movement but activated by two resilient elements one of which is adapted to overcome the resistance to relative movement of the two sensing elements, the other resilient element adapted to maintain the third sensing element in continuous contact with the other two sensing elements.

3,624,914
APPARATUS FOR MEASURING WHEEL ALIGNMENT

Henry Kosteriva, Victoria, British Columbia, Canada, assignor to K. and R. Industries Ltd., Victoria, British Columbia, Canada

Filed Dec. 1, 1969, Ser. No. 881,017
Int. Cl. G01b 5/24
U.S. Cl. 33—203.2 **1 Claim**

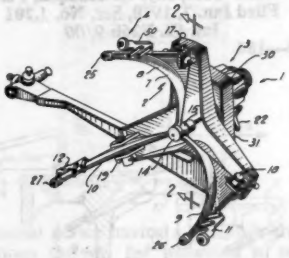


Apparatus for measuring the toe of front wheels of an automotive vehicle, a pair of hub engaging members adapted magnetically to cling to the wheel hubs. Both members carry supporting bars extending parallel to hubs of the wheels, and measuring rods adapted to be extended transversely across front and back ends of the supporting bars for determining toe of the wheels.

3,624,915
WHEEL ALIGNMENT APPARATUS

Edward D. Wilkerson, 595 Valley Road, Orange, N.J. 07050

Filed Jan. 5, 1970, Ser. No. 658
Int. Cl. G01b 9/08, 11/26
U.S. Cl. 33—203.18 **10 Claims**



This disclosure relates to improvements in the following features of wheel alignment equipment: (1) the wheel clamp, (2) the pivot post, and (3) the brake for locking the pivot post to the wheel clamp.

The improvement in the wheel clamp relates to a prior art clamp in which at least three support legs carrying wheel rim locks are adjustably driven into engagement with the wheel rim. The particular improvement in the clamp comprises an extensible leg with a wheel rim lock movably coupled relative to and supported on each of the support legs by a parallelogram linkage. Each of the extensible legs is manually placed to project beyond its associated support leg when it is desired to align wheels having relatively large diameters.

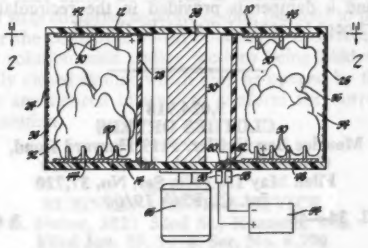
The improvement in the pivot post adapted to the foregoing extensible leg type clamp relates to having a pivot post of L-shaped configuration. This post, in the usual alignment operating position, includes a generally vertical supporting base and a generally horizontal optical-transit arm. The arm is attached to the lower end of the support base so that visual sighting may be generally made below the bumper of a vehicle having a high hood, such as a truck.

The improvement in the brake adapted to the foregoing clamp and pivot post includes a manually operated lock handle, a shaft rotated by the handle to drive two eccentric shaft sections, and a loop band having two ends each of which is fixed to a different shaft section. The band closely envelops a circular collar fixed to the wheel clamp. Rotation of the shaft selectively tightens and loosens the band about the collar to fix securely and accurately the post to the clamp.

3,624,916
ELECTROMAGNETIC MEANS FOR DRYING ARTICLES

James W. Jacobs, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

Filed June 24, 1970, Ser. No. 49,433
Int. Cl. B01k 5/00
U.S. Cl. 34—1 **2 Claims**



In preferred form, an electromagnetic clothes dryer including a generally cubic clothes receptacle having a pair of opposite side walls formed by the poles of a permanent magnet and electrodes on its top and bottom walls one of which is connected to the positive terminal of a direct current source and the other of which is connected to the negative terminal. The passage of electric current through damp clothing in a direction normal to the magnetic field produces a force on the water particles in the damp clothing which separates the water from the clothes.

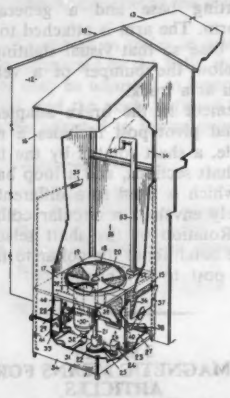
3,624,917
TOBACCO CURING SYSTEM

John F. Moore, 100 Hillsdale Ave. W., Toronto 7, Ontario, Canada

Filed Nov. 24, 1969, Ser. No. 879,380
Claims priority, application Canada, Nov. 23, 1968, 35,988
Int. Cl. F26b 21/06
U.S. Cl. 34—46 **7 Claims**

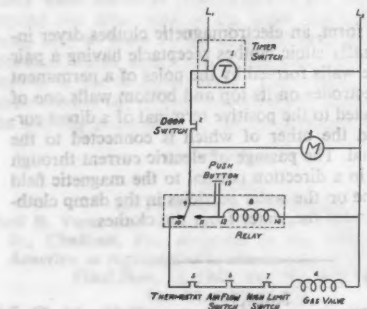
A tobacco curing system in which air is fed into the upper part of a kiln under controlled conditions of temperature and humidity. A duct is mounted on a kiln wall

in communication with upper and lower openings in the wall. The lower part of the duct is divided into two compartments each of which communicates with the outside air and the duct. Both compartments also communicate with each other. One chamber also communicates with the lower opening in the kiln to receive air which has passed through the kiln.



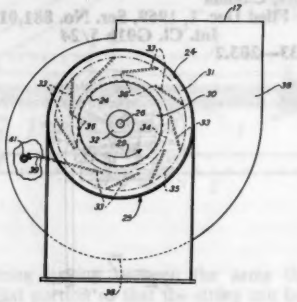
External air is drawn into one compartment, heated, mixed with the recirculated air in controlled proportions and forced through the duct and kiln by a fan. The air intake is controlled by dampers in the heating compartment and a damper is provided in the recirculated air compartment to control the intake thereof.

3,624,918
CLOTHES DRYERS
Maurice Ben Heftler, 1119 Harvard Road, Grosse Pointe Park, Mich. 48230
Filed May 15, 1970, Ser. No. 37,720
Int. Cl. F26b *19/00*
U.S. Cl. 34—48 **3 Claims**



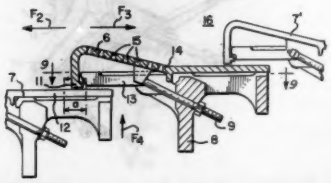
This invention consists of a relay operable by the user of a clothes dryer to alter the normal operation of the machine by turning off the heat while the machine continues to tumble the clothes and blow air through them to cool the clothes for wrinkle free drying of permanent press fabrics, which relay is coupled to the clothes door of the machine so that when the door is opened the action of the user is cancelled, restoring the dryer heat to the normal thermostatic control so that the next user of the machine is assured of receiving full drying capacity.

3,624,919
CLOTHES DRYING BLOWER WITH LINT STRIPPING DEVICE
John Joseph Miller, Cincinnati, Ohio, assignor to McGraw-Edison Company, Elgin, Ill.
Filed Mar. 13, 1970, Ser. No. 19,414
Int. Cl. F26b *19/00*
U.S. Cl. 34—85 **6 Claims**



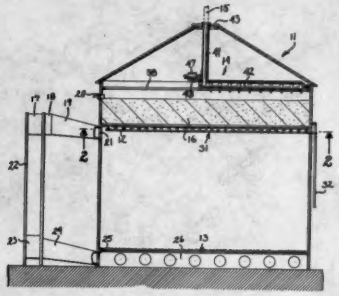
A clothes drying tumbler equipped with a blower for circulating a heated air during the drying operation has a nozzle for directing a fluid as of air or dry steam to exert a forward thrust onto the blower fan to remove the lint which collects on the leading edges of the fan blades. A flat nozzle is used and is positioned so that it is in line with each blade as the blade passes midway through the fluid stream. The fluid pressure to the nozzle is turned on at the end of each drying operation from the time the electric current is cut off from the drive motor to the time the blower is coasted to a near stop.

3,624,920
HEAT EXCHANGE GRATE AND SUPPORT FRAME ASSEMBLY
Pierre A. Coutelan, Eaubonne, France, assignor to Fuller Company, Catasauqua, Pa.
Filed Jan. 7, 1970, Ser. No. 1,201
Int. Cl. F26b *9/00*
U.S. Cl. 34—164 **6 Claims**



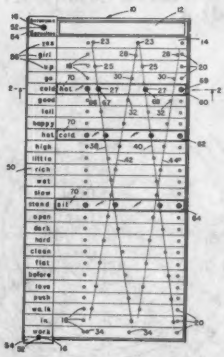
This invention relates to an improved heat exchange apparatus of the reciprocating grate type having a grate and support frame assembly wherein no portion of the support frame contacts the grate at a point forward of about substantially the midportion of the grate and the grate has at least one reinforcing flange depending therefrom, said flange having a downwardly-protruding extension with engaging means adapted to engage the support frame.

3,624,921
GRAIN DRYING AND STORAGE APPARATUS
Harlan J. Easton, Rte. 3, Box 607, Blooming Prairie, Minn. 55917
Filed Aug. 12, 1969, Ser. No. 849,941
Int. Cl. F26b *19/00*
U.S. Cl. 34—211 6 Claims



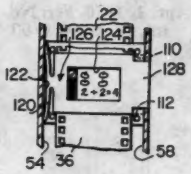
A grain drying and storage bin is disclosed that receives and evenly distributes grain over an upper floor grid where the grain is heated and dried. After drying is completed, the grain is transferred to a lower cooling floor by actuation of a linkage mechanism that simultaneously opens a plurality of openings in the upper grid.

3,624,922
EDUCATIONAL DEVICE
Dennis Rich, Flushing, N.Y., assignor to General Learning Corporation, Morristown, N.J.
Filed Apr. 3, 1970, Ser. No. 25,435
Int. Cl. G09b *3/02*
U.S. Cl. 35—9 R 9 Claims



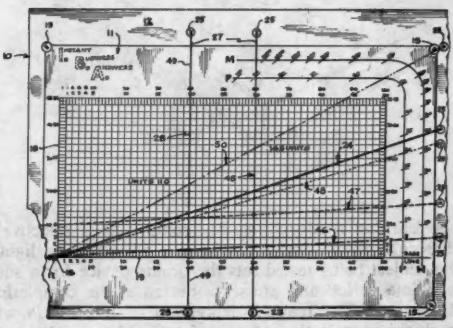
An educational device having a planar board provided with projections thereon for mounting a primary information bearing member and a plurality of secondary information bearing members for self-correcting and self-instructional teaching. The projections are disposed on the board in a preset arrangement so that each of the secondary information bearing members can be mounted on the board in only one position adjacent to the primary information bearing member. The information on the primary member is arranged in columnar form, whereby the secondary members are mounted in columnar form. Each secondary member is disposed in juxtaposition with correlated information on the primary member to self-teach an educational subject to the user of the device.

3,624,923
VISUAL TEACHING DEVICE
Jerome Oberwager, 30 Wensley Drive, Great Neck, N.Y. 11021
Filed Oct. 24, 1969, Ser. No. 869,129
Int. Cl. G09b *1/24*
U.S. Cl. 35—9 E 30 Claims



This invention is a visual teaching device of the type in which the student is provided wiht a series of problems and a choice of answers, and in which the student may continuously check his solutions as he goes through the teaching program of the device. The basis of this invention is one or more pairs of translucent film strips as contained within a cartridge means having an aperture for viewing or projection, together with means to independently move the strips so that a frame of a question strip and a frame of an answer strip can be placed in proper superimposed register within the aperture means to provide a composite visual problem-solution, which presents to the student in one frame a composite of the problem and answer material as a single picture. This single picture solution may either be correct or incorrect. The frames of each strip comprise separate coding portions to indicate whether the composite visual obtained is a correct or incorrect solution, said coding sections being hidden by a normally closed shutter which may be opened by the student at any desired interval to conform the correctness of his solution.

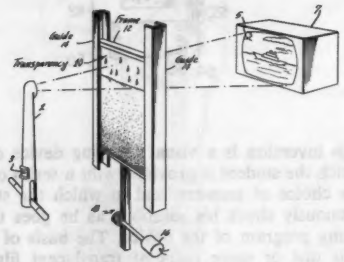
3,624,924
BUSINESS ANSWERS DEVICE
Russell C. Huber, 3121 52nd St., Kenosha, Wis. 53140
Filed Jan. 29, 1970, Ser. No. 6,790
Int. Cl. G09b *19/18*; G06c *3/00*
U.S. Cl. 35—24 R 10 Claims



A chart for determining business factors is removably secured to a backing member and orientated thereon by a post to which are attached stretchable cords. The cords

are positioned on the chart by a magnetized holder and the chart is removably secured to the backing member by magnets.

3,624,925
PERISCOPE BREAKWATER SIMULATOR
John W. Herndon, Orlando, Fla., assignor to the United States of America as represented by the Secretary of the Navy
Filed Apr. 1, 1970, Ser. No. 24,685
Int. Cl. G09b 9/00
U.S. Cl. 35—25 2 Claims

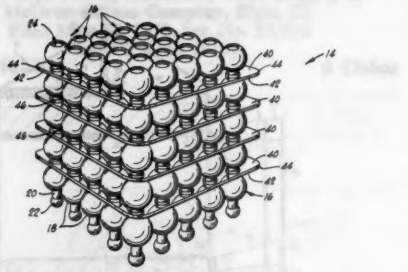


Provides means in a known periscope view simulator for generating the varying change of light effects observable during submarine periscope raising or surfacing operations and periscope lowering or submerging operations.

3,624,926
LEARNING REINFORCER
Michael Paul McCaughey, Highland Park, N.J. (Dept. of Physics, Rutgers University, New Brunswick, N.J. 08903)
Filed Oct. 13, 1969, Ser. No. 865,559
Int. Cl. G09b 17/04
U.S. Cl. 35—35 B 5 Claims

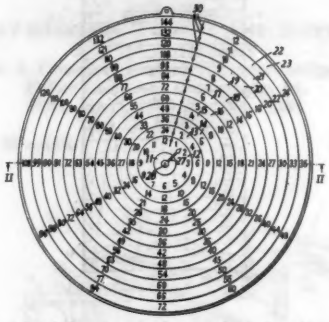
A learning reinforcer device comprising a selectively adjustable timing device and a pair of indicating lights. The subject being tested sets the timing device for a suitable time period and presses a button at the completion of the task. The manual depression of the button will cause the energization of one of said indicating lights in accordance with the time expired on the timing device to indicate whether or not the task had been completed within the time period allowed. This device is particularly suitable for a continuing task wherein continuous time segments are monitored.

3,624,927
BEAD COUNTING DEVICE
Margaret Whitehurst Sandlin, 2200 E. Central, Wichita, Kans. 67214
Filed Jan. 27, 1970, Ser. No. 6,063
Int. Cl. G09b 19/02
U.S. Cl. 35—32 3 Claims



This invention is a mathematical multiplication teaching structure including a plurality of planes of interconnectible beads. More particularly, this invention comprises a plurality of beads each having a stem extending therefrom and a cavity therein which functions to join them; the beads are held in a planar relationship by a spacing sheet preferably of thin flat transparent material having apertures therein to receive the stems of the beads.

3,624,928
DEVICE FOR TEACHING ARITHMETIC
June Cynthia Felton, Holmwood, Hadley Green, Barnet, England
Filed Apr. 15, 1970, Ser. No. 28,726
Claims priority, application Great Britain, Feb. 11, 1970, 6,610/70
Int. Cl. G09b 19/02
U.S. Cl. 35—31 A 9 Claims



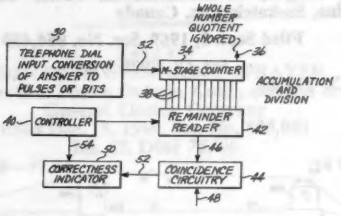
A device for teaching arithmetic has separate discs of different diameters mounted on a vertical post and each marked around its periphery with a separate one of the rows or columns of the "multiplication table," the numbers on each disc being arranged at the same angular interval around the disc. One of the discs is marked with the "one-times table," so that when the first numbers on the scales on each disc are in radial alignment the product or quotient of any two numbers within the range of the scales may be obtained. The discs may be removed from the post so that any selected disc may be used for

teaching the "table" in that disc, for example the "three-times" table. In addition the discs may be displaced angularly relative to one another on the post so that the numbers in radial alignment provide series of numbers conforming to a particular formula.

3,624,929
METHOD OF ELECTRICALLY COMPARING TEACHER AND STUDENT ANSWERS

Willis R. Swanson, deceased, late of Fulford Harbour, British Columbia, Canada, by Naola J. Swanson, executrix, Fulford Harbour, British Columbia, Canada, and Sidney P. Swanson, 101 S. Dorothy Drive, Richardson, Tex. 75080

Filed Aug. 27, 1970, Ser. No. 67,313
Int. Cl. G09b *7/00*
U.S. Cl. 35—48 **4 Claims**



In the operation of teaching apparatus, a method of comparing student and teacher answers employing congruency as a test of "correctness" or equivalence. In the disclosed method both the teacher's answer and student's answers are expressed in terms of one or more alpha-numeric symbols, which for each answer are encoded into equivalent numbers of code signal elements, totalled and divided by a common modulus to obtain a remainder code. A comparison of the remainder codes indicates in most cases statistically whether the answers are the same or not.

3,624,930
INSOLE WITH VENTILATING PASSAGES

Oney A. Johnson, Forestville, and Robert A. Clark, Piedmont, Calif., assignors of a fractional part interest to George B. White, San Francisco, Calif.

Filed July 30, 1969, Ser. No. 846,046
Int. Cl. A43b *13/38*
U.S. Cl. 36—43 **4 Claims**

An inner sole for a shoe, provided wtih longitudinal resiliently compressible ribs along its underface forming longitudinal open channels throughout the entire length of the insole from the heel end to the toe end, so that alternating foot pressure thereon from the heel to the toe, pumps air toward the toe; ventilating holes extend through the insole from the channels upwardly to direct air to the toes.

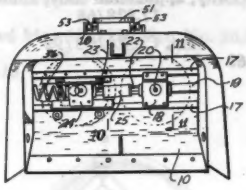
ERRATUM

For Class 36—67 see:
Patent No. 3,624,934

3,624,931
SNOWPLOW WITH RAIL MOUNTING BOTH FIXED AND MOVABLE ROTARY MEANS

Harold D. Wandscheer and Evert Wandscheer, both of Sioux Center, Iowa 51250

Filed June 25, 1969, Ser. No. 836,407
Int. Cl. E01h *5/09*
U.S. Cl. 37—43 F **3 Claims**

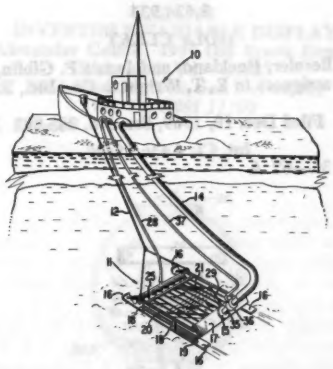


A snowplow adapted to remove snow and pack it into readily carried units. Heating means to partially thaw the snow to allow better packing is provided and improved cleats are used on the packing rotor. Signalling means for auxiliary trucks is included in the assembly.

3,624,932
APPARATUS FOR HARVESTING MOLLUSKS

Milton H. Doyle, Ardsley, N.Y., assignor to Borden Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 680,705, Nov. 6, 1967. This application Apr. 6, 1970, Ser. No. 25,687
Int. Cl. A01m *25/00*
U.S. Cl. 37—55 **6 Claims**



An apparatus for harvesting mollusks or the like comprising a dredge for gathering said mollusks; a tube

refining a path of travel for said mollusks open at one end adjacent and, secured to said dredge; a gas supply for directing gas under pressure into said tube adjacent the dredge to induce movement of the mollusks thereinto; equipment for measuring the pressure differential between the gas in said tube and the ambient pressure surrounding the dredge, and equipment operatively associated with the gas supply and measuring equipment to control the supply of gas in order to maintain a predetermined pressure differential.

3,624,933

DREDGING PLANT APPARATUS COMBINING PUMPING AND DIGGING ACTION

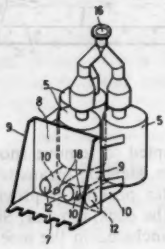
Giovanni Faldi, Via Por S. Maria 4, Florence, Italy

Filed June 12, 1969, Ser. No. 832,788

Claims priority, application Italy, June 17, 1968, 17,828/68

Int. Cl. E02f *3/92*

U.S. Cl. 37—63 **4 Claims**



Dredging plant apparatus in which the conventional pump body is integral with a digging shovel of an excavator. The device which is operative by thrusting or dragging action utilizes a shovel with a plurality of pump bodies opening in the rear of the shovel and with blowing nozzles also mounted thereon and with pump and nozzle openings directed in the direction of operation of the shovel.

3,624,934

GOLF CLEAT

Louis E. Bernier, Rockland, and James P. Giblin, Milton, Mass., assignors to E. T. Wright & Co., Inc., Rockland, Mass.

Filed Dec. 10, 1969, Ser. No. 883,892

Int. Cl. A43c *15/00*

U.S. Cl. 36—67 A **1 Claim**

A golf shoe cleat comprising a head from which stems a shank embodying a first portion and a tapered portion, characterized in that there is a conical shoulder at the junction of the first and tapered portions located at a distance from the head such that when incorporated in a shoe bottom the conical portion will be situated substantially at the tread surface. The first portion of the cleat may be of uniform diameter from the head to the tapered portion or may be of two diameters with a second conical shoulder at the junction of the portions of two diameters.

3,624,935

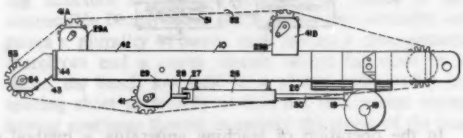
TRENCHER HAVING AN ENDLESS DIGGER AND ADJUSTABLE AUGERS

Robert G. Lawrence, Swift Current, Saskatchewan, Canada, assignor to Saskatchewan Power Corporation, Regina, Saskatchewan, Canada

Filed Sept. 2, 1969, Ser. No. 854,459

Int. Cl. E02f *5/06*

U.S. Cl. 37—86 **2 Claims**



An adjustable boom carrying an endless digging chain operated hydraulically and having a downwardly extending offset tip with the end of the boom adjustable for chain loosening and tightening. Transverse augers move excavated dirt away from the trench formed by the digging chain and these are adjustable along the length of the boom to compensate for the swinging movement of the boom which allows a trench to be dug at various depths as the digging proceeds.

3,624,936

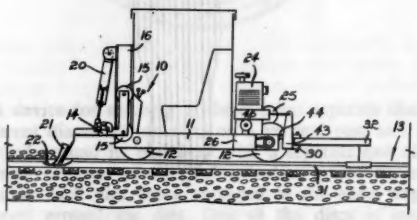
BALLAST REGULATOR

William James Yard, Cavan, South Australia, Australia, assignor to Aresco Trak-Chief Proprietary Limited, Cavan, South Australia, Australia

Filed Aug. 27, 1969, Ser. No. 853,317

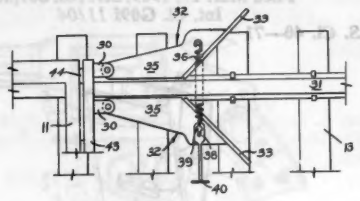
Int. Cl. E01b *27/04*

U.S. Cl. 37—104 **9 Claims**



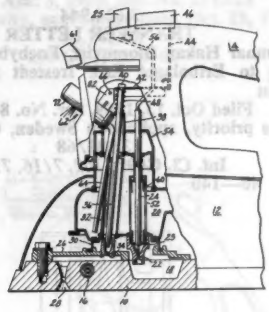
Ballast levelling and regulating device for levelling ballast dumped on rail tracks, the device being provided with plow blades and skid plates which can be raised or

lowered, the skid plates extending in a fore and aft direction and being effective in preventing the device from



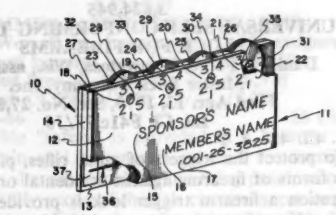
tearing or dislodging the ties supporting the rails as the device moves along the rails to level the ballast.

3,624,937
IRON WITH CLEANABLE SPRAYER
Harold S. Foster, Ontario, Calif., assignor to General Electric Company
Filed Dec. 15, 1969, Ser. No. 885,081
Int. Cl. D06f *75/06*
U.S. Cl. 38—77.83 **14 Claims**



The disclosure herein shows a steam and spray iron werein the sprayer is self-cleaning to remove any deposits when the iron is used with tap water.

3,624,938
FOOLPROOF CREDIT CARD
Lewis George Richard, Pacific Palisades, Calif., assignor to Kazuo Nakano, Gardena, Calif.
Filed Jan. 8, 1970, Ser. No. 1,380
Int. Cl. G09f *3/02*; H01h *43/08*; G06k *7/06, 19/04*
U.S. Cl. 40—2.2 **7 Claims**



A self-authenticating credit card device includes a plurality of discs rotatably positioned in a card with portions projecting beyond an edge of the card so that a person may freely rotate the discs with a thumb or a single finger. Stationary indicia marked on the card corresponds with movable indicia marked on the discs so that a predetermined secret combination known only to an authorized card user may be established.

When the discs are rotated to establish the secret combination then wiper blades carried by the discs are urged into electrical contact with associated segments of an electrical circuit to switch the electrical circuit from an interrupted condition to a closed condition. When the electrical circuit in its closed condition is coupled to a signal circuit associated with a credit card information recording device, a signal will be imparted to indicate that the person possessing the card is a valid authorized user.

3,624,939
NOVELTY CONTAINER FOR PHOTOGRAPHS
Wayne T. Gossard, Alhambra, Calif., assignor of a fractional part interest to Oxford W. Prisk, San Gabriel, Calif.
Filed May 13, 1970, Ser. No. 36,947
Int. Cl. G09f *3/18*
U.S. Cl. 40—10 **4 Claims**

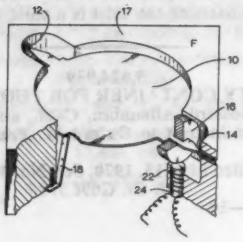
A pair of housing parts are hinged together to define an enclosure for a plurality of photographs. A retainer on one of the housing parts receives peripheral apertures in the photographs to maintain them in planes parallel to the axis of the hinge.

3,624,940
INVERTIBLE VARIABLE DISPLAY
Frank Alexander Geddie, 4900 Old Brook Road, Apt. 6, Richmond, Va. 23227
Filed June 24, 1970, Ser. No. 49,271
Int. Cl. G09f *11/00*
U.S. Cl. 40—28 **4 Claims**

A hollow transparent ball has two oppositely disposed flats whereby the ball can be held in place by resting on

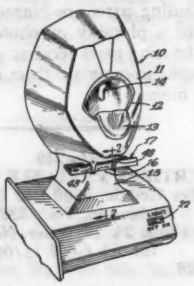
either flat. Means in the ball provide a first display when the ball rests on one flat and provide a second display automatically changed from either one to the other when the ball is inverted from its original position.

3,624,941
REVERSIBLE SIGN ELEMENT
Sydney F. Chantry, Weston, Ontario, Canada, assignor to Ferranti-Packard Limited, Toronto, Ontario, Canada
Filed Dec. 29, 1969, Ser. No. 888,714
Int. Cl. G09f *11/00*
U.S. Cl. 40—52 R **6 Claims**



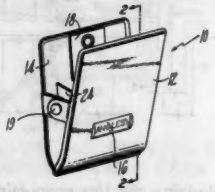
With a magnetically actuable reversible sign element a stationary ratchet element limits rotation in one direction and holds the element at a point where it may always be rotated by reversing an exterior magnetic field.

3,624,942
SLIDE DISPLAY STRUCTURE
Robert E. N. Klohr, Fenton, Mo., assignor to Sherwood Medical Industries Inc.
Filed July 18, 1969, Ser. No. 842,969
Int. Cl. G09f *11/30*
U.S. Cl. 40—64 A **6 Claims**



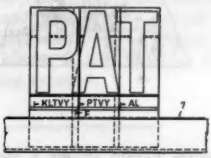
A slide display structure for holding viewing elements such as transparencies or pictures at a display position. The slide display structure includes a carrier portion adapted to hold a plurality of such viewing elements and is provided at one edge thereof with an upstanding information providing means which is further adapted for cooperation with associated apparatus for indexing the slide display structure. The information providing means may serve as a manipulating portion of the slide display structure. The slide display structures are adapted to be stored in a suitable drawer, or the like, with the information means viewable to facilitate selection of desired display structures.

3,624,943
MOVING MESSAGE CLIP
Robert Lewtan, 11 Arlen Way, West Hartford, Conn. 06117
Filed Mar. 17, 1969, Ser. No. 807,805
Int. Cl. G09f *11/04*
U.S. Cl. 40—71 **7 Claims**



A changeable display device which can be made integral with various items, the items thereupon being provided with a window through which the display is viewed. A rotatable member carrying information to be displayed is moved, via linkages attached to a movable member of the item, so as to change the display each time the item is employed.

3,624,944
TRANSFER LETTER
Kurt Gunnar Hakan Blomqvist, Enebyberg, Sweden, assignor to Eribolaget Erik Irestedt AB, Stockholm, Sweden
Filed Oct. 13, 1969, Ser. No. 865,744
Claims priority, application Sweden, Oct. 16, 1968, 13,983/68
Int. Cl. G09f *7/02, 7/16, 7/20*
U.S. Cl. 40—140 **1 Claim**

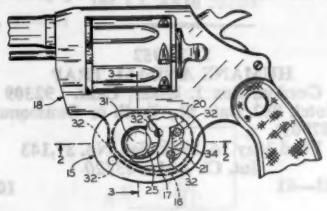


A transfer letter consisting of a letter image detachably applied to a temporary base intended to be transferred to a permanent base in the form of a text etc. together with other letter images of similar design by removal of the bases. Marks are applied to the base within the edge thereof which indicate the relative lateral position together with other letter images with regard to the light space formed by adjacent letters.

3,624,945
UNIVERSAL SELF-CONFORMING TRIGGER LOCK FOR FIREARMS
Daniel J. Foote, Wauwatosa, Wis., assignor to Master Lock Company, Inc.
Filed Apr. 13, 1970, Ser. No. 27,684
Int. Cl. F41c *27/10*
U.S. Cl. 42—1 Y **6 Claims**

To protect the triggers of guns, rifles, pistols and various forms of firearms against accidental or unauthorized operation a firearm trigger lock is provided for detachable, self-conforming and non-shiftable mounting on the trigger guard portion of a firearm to enclose the latter and prevent unauthorized movement of the firearm trigger. A cover section of the trigger lock carries a transverse cylinder shell and strategically located transverse, axially

yieldable plungers and other means designed to engage portions of the trigger guard and trigger to prevent movement of the latter and prohibit shifting of the trigger lock regardless of how it is mounted on the trigger guard.



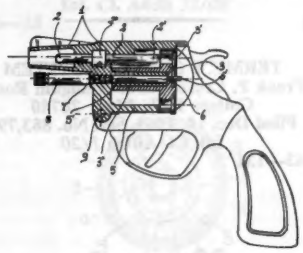
Moreover, the trigger lock is universal in respect to its adaptability to trigger guards of various shapes and sizes and the disposition of the trigger therein, permitting its use on firearms of various types.

3,624,946

SAFETY TOY REVOLVER WITH STEEL PIN PREVENTING THE USE OF CARTRIDGES WITH BULLETS

Francesco Cagnoni, Via S. Vittore 36, Milan, Italy

Filed Apr. 3, 1969, Ser. No. 813,028
Claims priority, application Italy, Oct. 19, 1968, 22,743/68
Int. Cl. F41c *3/06*
U.S. Cl. 42—58 **2 Claims**



A safety toy revolver which comprises a barrel body made of a relatively fragile alloy, and a pin of case-hardened steel which has pointed ends and a collar intermediate said ends and is inserted in the barrel body so as to completely obstruct the barrel bore, said pin being dimensioned so that one end thereof is just clear of a rotatable magazine of minimum thickness, in such a manner as to prevent cartridges with bullets to be introduced into the rotatable magazine.

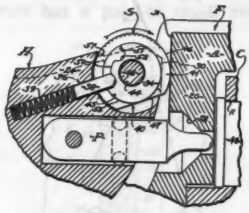
3,624,947

HAMMER SAFETY FOR FIREARMS

George H. Worrall, Sr., Los Angeles, Calif., assignor to Salford Imports, Inc., Culver City, Calif.

Filed June 25, 1969, Ser. No. 836,370
Int. Cl. F41c *17/00, 17/04, 17/08*
U.S. Cl. 42—66 **18 Claims**

An accessible "safety" is provided in a hammer of a firearm wherein said hammer is exposed for manipulation, whereby alternate blocking and firing positions of the safety are readily accomplished as circumstances require. In the safetied condition, the safety is positioned to block entry of the firing pin through the frame by establishing an abutment at or about the place of entry of said pin through said frame. In the firing condition, the safety is positioned to permit entry of the firing pin through the frame, by removing said abutment from said place of entry. The safety is manually movable between alternate positions, being held in alternate "safe" and "fire" positions by detent means. A feature is durability which involves a hardened safety element that is movable and that seats directly in the hammer.



3,624,948

FISHING ROD AND REEL CASE

Gordon T. De Baker, Sr., 1647 Forest Glen, Green Bay, Wis. 54304

Continuation-in-part of application Ser. No. 848,542, Aug. 8, 1969. This application Apr. 6, 1970, Ser. No. 25,955
Int. Cl. A01k *97/08*
U.S. Cl. 43—26 **11 Claims**

A tubular case for a combined fishing rod and reel, wherein only the rod shaft, line and hooks are received within the tubular case, and the attached reel and handle means are disposed externally thereof, and wherein the rim of the case is held urged against the handle means by means of a tensioned elastic band, thereby securing the tubular case in a position covering the rod shaft, line, and hooks, only, and excluding the rod handle and reel, therefrom.

3,624,949

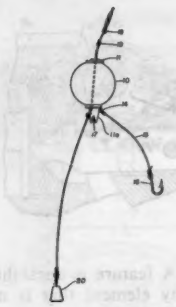
FISH HOOK POSITIONING DEVICES

Frederick S. Lowndes, 106 Tyler Road, Pittsburgh, Pa. 15237

Filed Oct. 20, 1969, Ser. No. 867,636
Int. Cl. A01k *93/00*
U.S. Cl. 43—43.15 **6 Claims**

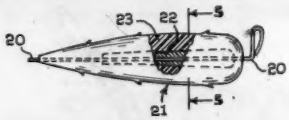
A fish hook positioning device is provided for positioning a hook relatively to a fish line and comprising a floatation member having a passageway therethrough adapted

slidingly to receive a fish line, a drop line attaching means on the floatation means, and a line stop engaging means



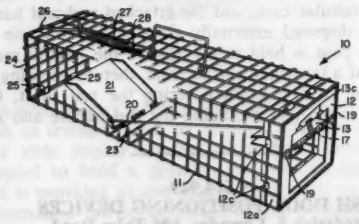
on the passageway adapted to engage a stop on the line and hold the floatation means at the stop position.

3,624,950
WEIGHT INSERTS FOR BAIT FISH
Nicholas P. Merckes, % L. Balzer, 3409 S. Whitnall Ave., Milwaukee, Wis. 53207
Filed Oct. 17, 1969, Ser. No. 867,147
Int. Cl. A01k *83/06*
U.S. Cl. 43—44.2 **1 Claim**



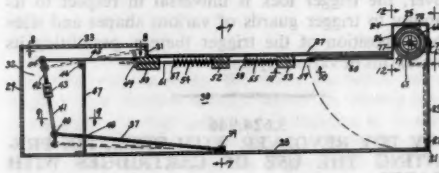
A weighted insert for bait fish having an external angular projection apertured to be threaded on the fish line leader between the swivel and the hook or hook gang, said insert having a plurality of exterior barb points disposed toward said angular projection.

3,624,951
CAGE TYPE ANIMAL TRAP
John W. Gilbaugh, 19396 Monte Vista Drive, Saratoga, Calif. 95070
Filed July 13, 1970, Ser. No. 54,220
Int. Cl. A01m *23/04, 23/08, 23/18*
U.S. Cl. 43—61 **6 Claims**



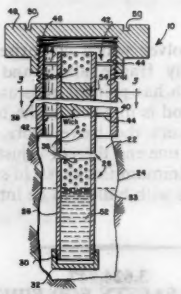
An animal trap is made in the form of a wire mesh cage provided with a door made in two sections hinged together. The upper part of the door is hinged to a door frame which is attached to the wire mesh cage. The hinge attaching the door to the door frame includes a wire member having a hook in the central portion thereof between hinge elements for latching the door in open position. One end of this wire member is in the shape of a lever attached to the trip mechanism which is actuated by the animal entering the cage so that the door latch is released and the door closed under spring pressure.

3,624,952
HUMANE ANIMAL TRAP
Arthur E. Gordon, Box 1, Baker, Calif. 92309 (Apt. 1, Villa Motel, 902 Data St., Truth or Consequences, N. Mex. 87901)
Filed May 14, 1970, Ser. No. 37,143
Int. Cl. A01m *23/20*
U.S. Cl. 43—61 **10 Claims**



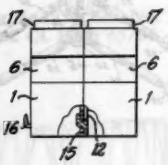
An animal trap having a spring-actuated hinged trap door and a treadle-operated interior door-releasing trigger mechanism. The hinged trap door is provided with a reversible ratchet mechanism for holding the door open while the trigger mechanism is being set and for latching the door closed after release by the trigger mechanism.

3,624,953
TERMITE CONTROL SYSTEM
Frank P. Crosby, 5033 Mangum Road, College Park, Md. 20740
Filed Dec. 10, 1969, Ser. No. 883,794
Int. Cl. A01m *1/20*
U.S. Cl. 43—131 **5 Claims**



A termite control system includes an insecticide dispensing pipe vertically disposed within a hole adjacent to a dwelling. The pipe has a lower unperforated portion for receiving a liquid insecticide and an upper portion having perforations through which the insecticide is dispensed in vapor form. A sleeve is provided at the upper end of the hole for mounting the pipe with its outer surface spaced inwardly from the walls of the hole so that the insecticide in vapor form may permeate the soil surrounding the hole. A wick may be provided within the pipe to facilitate transfer of the liquid upwardly in the pipe.

3,624,954
COMBINED BOX AND CONSTRUCTION TOY, INCLUDING CONNECTING MEANS
Germaine van der Veken, Vrijheidslaan 171, Brussels 8, Belgium
Filed Sept. 19, 1969, Ser. No. 859,456
Int. Cl. A63h 33/08
U.S. Cl. 46—11 3 Claims



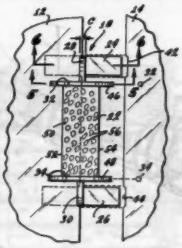
A combined box and toy is formed with a transverse slot into which the sidewalls of another box may be inserted. A hook carried by the sidewall of one box is adapted to be hooked onto the sidewall of an adjacent box at the transverse slot or at an aperture formed in one of the sidewalls of the adjacent box.

3,624,955
DISC-SHAPED BLOCKS WITH CYLINDRICAL PROJECTIONS AND CONCENTRIC WALLS
Takashi Matsubayashi and Hirozo Matsubayashi, Habikino-shi, Japan, assignors to Nintendo Playing Card Co., Ltd., Kyoto-shi, Kyoto, Japan
Filed Feb. 6, 1969, Ser. No. 797,164
Claims priority, application Japan, Feb. 17, 1968, 43/11,821; May 27, 1968, 43/43,677
Int. Cl. A63h 33/08
U.S. Cl. 46—25 10 Claims

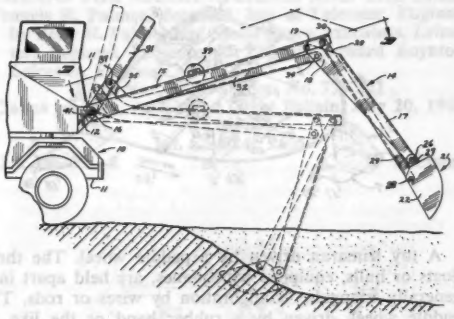
Each block of the mutually couplable assembling toy has a disc base plate, on one side of which is provided one or more cylindrical walls projecting vertically and concentrically therefrom and on the other side are provided plural cylindrical projections. The block of one embodiment has a cylindrical outermost wall and the block of another embodiment has a partially conical outermost wall. These walls and projections are arranged and constructed so that at least some of the projections of one block are fitted between the walls of another block when piled one on another.

3,624,956
BRIDGE CONNECTOR FOR TOY LAYOUT
Ralph Dunn, Manhattan Beach, Stephen W. Piurkowsky, Torrance, and Armando P. Villasana, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Feb. 24, 1970, Ser. No. 13,396
Int. Cl. A63h 33/10
U.S. Cl. 46—31 3 Claims

A connector for holding sheets of cardboard together while appearing to bridge roads printed on the sheets comprising an upper bridging portion for lying over the space between a pair of sheets, a pair of lower bridging portions for lying beneath the sheets and holding them against the upper bridging portion, and a pair of intervening portions passing between the sheets to join the upper and lower bridging portions. The intervening portions hold each lower bridging portion so that it lies beyond a respective end of the upper bridging portion. Each of the cardboard sheets has a pair of small recesses formed along its edge for receiving the intervening portions of the bridge connector, so that there is substantially no apparent gap between the sheets. The upper bridging portion has small protuberances that fit into corresponding holes in the cardboard sheets, to resist separation of the sheets.



3,624,957
SCOOP SHOVEL FOR TOY VEHICLES
Thomas W. Good, Golden Valley, Minn., assignor to Tonka Corporation, Mound, Minn.
Filed May 26, 1969, Ser. No. 827,666
Int. Cl. A63h 33/30
U.S. Cl. 46—40 2 Claims

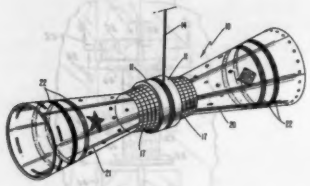


An articulated type scoop shovel for mounting on a toy vehicle having inner and outer booms interpivoted end to end with the inner end of the inner boom pivoted to the vehicle and a scoop bucket pivoted to the outer end of the outer boom, a handle on the inner boom for raising and lowering it about its vehicle pivot, a lever adjacent the vehicle pivot, and linkage connecting the lever to the bucket for tilting the bucket about its pivot by manual operation of the lever.

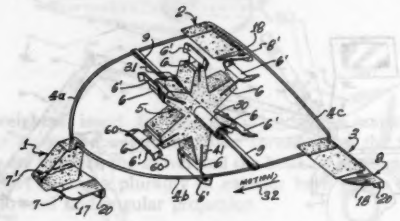
3,624,958
NOVELTY AERIAL TOP
Stephen J. Salayka, 30 Montrose Ave., Brooklyn, N.Y. 11206
Continuation-in-part of applications Ser. No. 557,923, June 15, 1966, and Ser. No. 839,737, Dec. 12, 1968. This application Aug. 14, 1970, Ser. No. 63,712
Int. Cl. A63h 1/30
U.S. Cl. 46—61 18 Claims

A string actuated aerial top having a central main body wherein the weigth of the top is mainly concentrated. To the main body on both sides thereof there are secured

extension members having a total weight which is substantially less than that of the main body of the top. At least one of such extension members in the form of a thin-walled axially elongated body of revolution. The axial length of the main body is a small fraction of the total length of the top. The extension members markedly alter the appearance and performance of the top. The extension members, or at least a part of such members, are preferably removably secured to the remainder of the top whereby the appearance and performance of the top may be quickly altered.



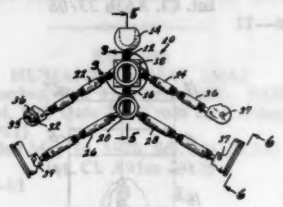
3,624,959
TOY TRIMARAN WATERCRAFT
John P. Quirk, 970 W. 19th St., Costa Mesa, Calif. 92627
Filed Dec. 5, 1969, Ser. No. 882,450
Int. Cl. A63h *23/02*
U.S. Cl. 46—93 **8 Claims**



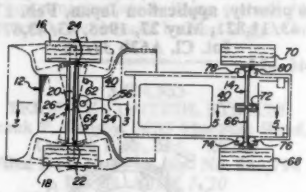
A toy trimaran driven by a paddle wheel. The three floats or hulls, equipped with planes, are held apart in a generally triangular configuration by wires or rods. The paddle wheel, driven by a rubber band or the like, is located inside this triangle. The hulls and paddle wheel may be made of plastic foam, and the planes and paddles made of light semi-rigid sheet material and inserted into slits therein. The paddles have a novel shape which produces an upward thrust reaction to assist in the hulls rising up on their planes. In operation, the craft planes at a relatively high speed for a long range. No adhesives nor separate fasteners are needed in the construction. The craft can be assembled from a kit without using tools.

3,624,960
POSABLE FIGURE MANIKIN
Henry J. Folson, Redondo Beach, J. Stephen Lewis, Pacific Palisades, Marius J. Morin, Torrance, and John W. Ryan, Los Angeles, Calif., assignors to Mattel, Inc., Hawthorne, Calif.
Filed Oct. 31, 1969, Ser. No. 872,949
Int. Cl. A63h *3/00*
U.S. Cl. 46—151 **1 Claim**

A bendable toy figure which is economical to produce comprising a body wire, arm wire, and leg wire, all of the wires being bendable and covered by a flexible plastic material that defines a mechanical man. The center of the arm wire, which extends through the chest portion of the figure, has a single bend, so that the arms extend at about a 120° angle from each other. The head of the figure is featureless and a separate hat with ear flaps is provided which engages the head for rotation thereon, so that the figure appears to face in a direction defined by the orientation of the hat.

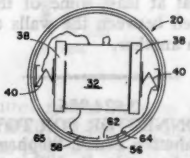


3,624,961
TOY VEHICLE BOGIE
Jacob Clarence Brubaker, Lancaster, Pa., assignor to Gabriel Industries, Inc., New York, N.Y.
Filed Feb. 5, 1969, Ser. No. 796,681
Int. Cl. A63h *17/26*
U.S. Cl. 46—221 **10 Claims**



A steerable toy vehicle has a bogie which responds to a force applied to the vehicle body to turn the vehicle in the direction of the applied force; the bogie is mounted so as to turn and cant.

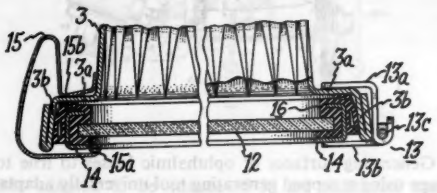
3,624,962
SELF-MOVING TOY
Kenneth E. Sykes, 2932 Perdue Ave., Columbus, Ohio 43224
Filed Dec. 11, 1970, Ser. No. 97,145
Int. Cl. A63h *5/00*
U.S. Cl. 46—232 **3 Claims**



An improved self-moving toy characterized by a compact inner structure adaped to be wholly mounted within an appropriately shaped shell means and includes a novel single moving part driven by a battery powered motor to produce both motion and sound to amuse the user. The switch means for turning the motor on and off is

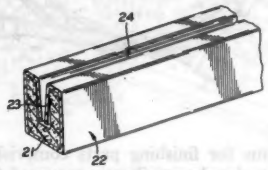
also wholly contained within the shell means with no outer depression or protrusion on the outer surface of the shell means.

3,624,963
SEAL DEVICE
Mitchell M. Osteen, Zirconia, and James L. Grindle, Hendersonville, N.C., assignors to General Electric Company
Filed Apr. 6, 1970, Ser. No. 25,996
Int. Cl. E05b *65/06*
U.S. Cl. 49—394 **10 Claims**



Seal for hinged glass cover for reflector of luminaire comprises an annular resilient gasket having an inner grooved mounting portion for embracing the edge of the glass cover, an intermediate recessed portion in which the frame of the glass cover is received, and the outer sealing portion sloping downwardly and outwardly from the cover frame and having wedge-shaped compressible portions at top and bottom which co-act with the flanged rim of the reflector in the closed position of the cover for tightly sealing the cover to the reflector rim.

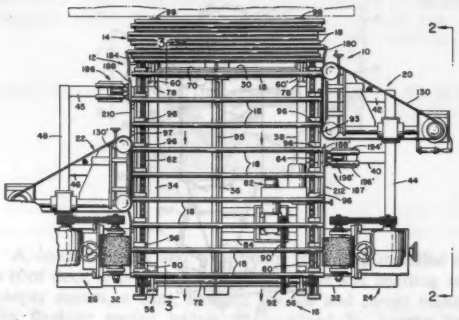
3,624,964
CHANNEL-TYPE WEATHERSTRIP FOR SLIDABLE CLOSURES
Paul G. Bordner, Franklin County, Ohio, and Vernon P. Fredricksen, Washington County, Minn., assignors to Crane Plastics, Inc., Columbus, Ohio
Filed Feb. 2, 1970, Ser. No. 7,785
Int. Cl. E06b *7/23*
U.S. Cl. 49—475 **3 Claims**



A channel-shaped weatherstrip of non-absorbent flexible plastic materials for installation in a bearing edge of a slidable closure and having a sandwich construction made up of a relatively thin outer layer of a first, relatively hard, wear-resistant plastic and an inner core of a relatively soft, flexible, foamed or expanded plastic.

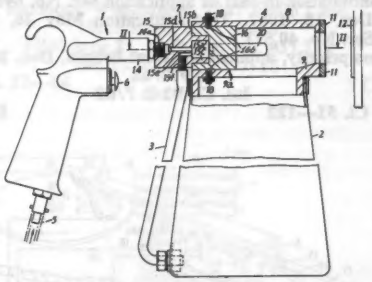
3,624,965
END FINISHING APPARATUS
Paul J. Gepfert, Shaker Heights, Ohio, assignor to Loopco Industries, Inc.
Filed Mar. 30, 1970, Ser. No. 23,686
Int. Cl. B24b *7/00*
U.S. Cl. 51—3 **11 Claims**

An apparatus for finishing the ends of elongated members such as rods, tubes, pipes or the like. The disclosed apparatus includes a conveyor which conveys the members along a path in parallel, side-by-side relationship. The conveyor is arranged to rotate the members about their longitudinal axes and move them past a first pair of endless belt abraders which are positioned on opposite sides of the conveyor and act sequentially on the opposite



ends of the members. Associated with each belt abrader is an end positioning guide plate device which functions to properly locate the members. Mounted after the belt abraders are a pair of rotary belt abraders which are positioned directly opposite one another and simultaneously act on both ends of the members.

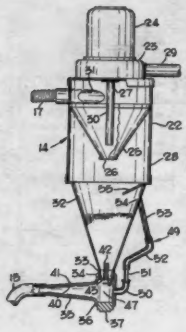
3,624,966
MEANS FOR MARKING GLASS AND THE LIKE
Francis R. Palmer, deceased, late of Leicester, England, by Peter R. Palmer and Shelia Bruce, executors, Leicester, England, assignors to Thomas Edward Boynton, Leicester, England
Filed Nov. 27, 1968, Ser. No. 779,321
Claims priority, application Great Britain, July 20, 1968, 34,741/68
Int. Cl. B24c *3/06*
U.S. Cl. 51—8 **8 Claims**



Portable spraying appliance for etching glass to the form of a stencil to mark e.g. a vehicle's registration number on its windows as an anti-theft precaution. Comprises a spray gun for spraying abrasive powder into one end of a casing at the other end of which, one or more stencils are located or to be located. Stencil(s) either mounted in a holder on the casing or preferably taped to the surface to be marked. In latter event, casing is open ended and is in use placed over stencil(s) while gun is operated.

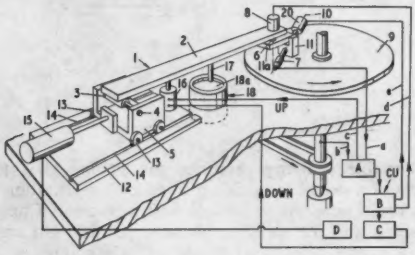
Gun includes nozzles for spraying into casing. May be plurality of nozzles swivellable to direct abrasive from side to side in casing, or one or more fixed nozzles.

3,624,967
PEENING MACHINE
Charles E. Kamper, R.R. 2, and Richard R. Compton, % Zero Manufacturing Co., 811 Duncan Ave., both of Washington, Mo. 63090
Filed Sept. 2, 1969, Ser. No. 854,640
Int. Cl. B24c 3/06
U.S. Cl. 51—8 10 Claims



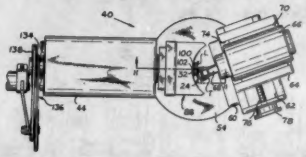
This peening machine includes a storage reservoir coupled to a metering chamber and supplying a discharge gun and the machine is provided with a flow control reclaim unit. The control apparatus includes a by-pass conduit which purges residual blasting material from the metering chamber and the discharge ductwork, and returns it to the reservoir. The purging action is effectuated by suction from a blower located in the reservoir, the suction being applied to the metering chamber via the by-pass conduit when the gun is inoperative. A metering platform below the reservoir orifice collects blasting material and effectively plugs the orifice to preclude escape of the blasting material from the reservoir when the gun is inoperative.

3,624,968
GEM STONE POLISHING MACHINES
Alec Leibowitz, London, England, assignor to Spectrum Diamonds (Proprietary) Limited, London, England
Continuation-in-part of application Ser. No. 690,915, Dec. 15, 1967. This application May 26, 1970, Ser. No. 40,571
Claims priority, application Great Britain, Dec. 20, 1966, 56,978/66
Int. Cl. B24b 7/02
U.S. Cl. 51—122 5 Claims



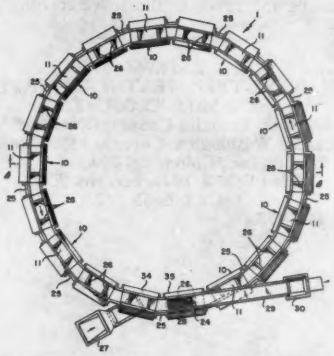
A machine for automatically faceting gem stones which enables a complete ring of facets to be formed on a stone automatically, the machine having a control system for automatically polishing each facet to the same depth and automatically indexing the stone to different facet forming positions between each polishing operation.

3,624,969
LENS GENERATING APPARATUS
Ernest T. Dalton, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Continuation-in-part of application Ser. No. 840,887, May 1, 1969, which is a division of application Ser. No. 626,448, Mar. 28, 1969, now Patent No. 3,492,764. This application July 15, 1970, Ser. No. 54,935
Int. Cl. B24b 29/00
U.S. Cl. 51—131 14 Claims



Generating surfaces of ophthalmic lenses to true toric shape using a cupped generating tool universally adaptable to the production of lenses of different refractive powers.

3,624,970
FINISHING MACHINE HAVING RESILIENTLY SEGMENTED FINISHING CHAMBER
Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.
Filed Sept. 10, 1968, Ser. No. 758,911
Int. Cl. B24b 31/06, 31/10, 1/00
U.S. Cl. 51—163 2 Claims

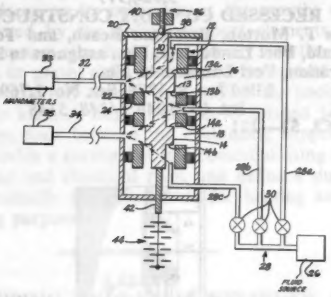


An apparatus for finishing parts comprising an elongated finishing chamber resiliently mounted for vibration and divided into segments, vibratory means operatively associated with each segment, and a flexible connecting member connecting adjacent segments, thus forming a continuous elongated finishing chamber, which can be used in effectively finishing parts having relatively great lengths or in effective continuous processing.

3,624,971
GRINDING CONTROL SYSTEM AND METHOD
Richard J. Levi, 256 Irving Ave., Closter, N.J. 07624
Filed Aug. 30, 1968, Ser. No. 766,358
Int. Cl. B24b 49/00
U.S. Cl. 51—165.74 16 Claims

A grinding control system for a valve assembly including means for determining the relative position between one member of the valve assembly and a reference standard similar to the other member of the assembly so that

the assembly will provide a predetermined control of fluid flow, a transducer responsive to this relative position for generating an electric signal which is received by a storage



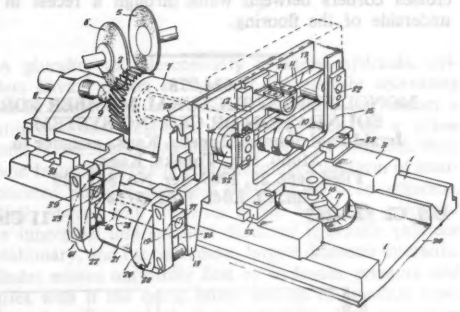
means adapted to be connected to an additional transducer for controlling the grinding of the stem member. A method for controlling the grinding.

3,624,972

GENERATING MECHANISM FOR A GEAR GRINDING MACHINE FOR HELICAL GEARS

Willi Graf, Zurich, Switzerland, assignor to Maag Gear Wheel & Machine Company Limited, Zurich, Switzerland

Filed May 19, 1970, Ser. No. 38,768
Claims priority, application Switzerland, June 3, 1969, 8,391/69
Int. Cl. B24b 5/16
U.S. Cl. 51—232 **2 Claims**



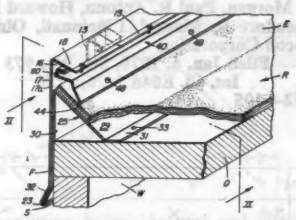
In generating mechanism for a gear grinding machine for helical gears, on which a workpiece having helical teeth which are to be ground is mounted on a generating slide, a rolling pitch block is fitted to a work spindle which is to carry the workpiece, the rolling pitch block is encircled by rolling pitch tapes, the ends of which pitch tapes are fixed to the pitch block and to a secondary slide, and both the secondary slide and the generating slide are moveable parallel to each other and at right angles to the workpiece axis. The rolling pitch tapes are passed round return idler guide pulleys, the said guide pulleys are mounted in a tape stand which is moveable parallel to the generating slide and to the secondary slide, and the said tape stand is moveable from side to side by a sliding block which is slidable in a guideway which is angularly adjustable according to the helix angle of the teeth of the workpiece.

3,624,973

CONJOINT FACIA AND WATER DAM

Julian J. Attaway, Tucker, Ga., assignor to Miscellaneous Manufacturing Corporation, Tucker, Ga.

Filed Jan. 7, 1970, Ser. No. 1,123
Int. Cl. E04d 13/15
U.S. Cl. 52—60 **15 Claims**



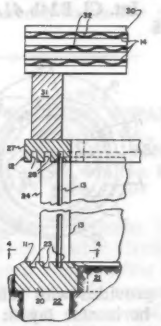
A conjoint facia and water dam for being installed on a roof deck is provided comprising facia and heading and keeper means, a cant, flashing means, and thrust means, the flashing means being characterized by having first and second wall and bearing components and an interconnecting bight portion for engaging the first wall and bearing component with keeper structure of the facia and heading and keeper means in a recess bordered by an upper facia and heading portion of the latter means for the flashing means to extend behind a facia wall of the facia and heading and keeper means having the facia wall upstanding from an end of a roof deck and the second wall and bearing component of the flashing means covering and bearing upon an end of roofing on the cant, the latter supported on the roof deck behind the facia wall, while the thrust means engages the second wall and bearing component of the flashing means with the facia and heading and keeper means in an area of the keeper structure of the latter located exteriorly of the recess for the flashing means to clamp the end of roofing under the second wall and bearing component to an inclined surface of the cant.

3,624,974

BUILDING ENCLOSURE STRUCTURE

Raymond Waddington, 1347 Jamie Lane, Homewood, Ill. 60430

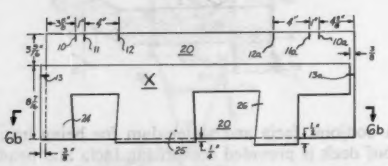
Filed June 27, 1969, Ser. No. 837,115
Int. Cl. E04b 2/82, 7/16
U.S. Cl. 52—64 **2 Claims**



A horizontal base wall frame having track grooves in the upper surface thereof. A roof frame including spaced roof beams, wall track grooves in a bottom surface of

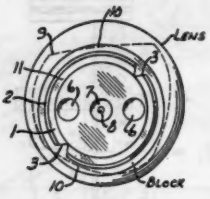
the roof frame, and parallel roof track grooves in facing vertical surfaces of the roof beams. Wall and roof panels slidable in the track grooves of the base wall frame and roof frame.

3,624,975
STRIP SHINGLE OF IMPROVED AESTHETIC CHARACTER
Albert R. Morgan, Paul R. Antoun, Howard E. Callahan, and Theodore R. Maugel, Cincinnati, Ohio, assignors to Panacon Corporation
Filed Jan. 6, 1970, Ser. No. 973
Int. Cl. E04d *1/26, 1/36*
U.S. Cl. 52—105 **19 Claims**



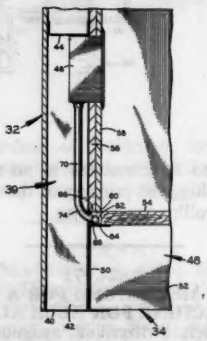
A laminated, mineral-surfaced, asphalt strip shingle, which, when laid in courses on a roof, simulates the irregularity and attendant shadow effects found in wood shingles, while complying with Underwriters' Laboratories, Inc. standards for fire retardant asphalt shingles. A rectangular "monotab" base lamina and an "apron overlay" lamina are adhered together with roofing asphalt. The overlay lamina is of the same length as the base lamina and has a plurality of approximately rectangular tabs of varying widths and lengths, some of which project beyond the bottom edge of the base lamina, and is laterally offset with respect to the base lamina by a small amount, so as to cover the butt joint between adjacent base laminae in the same courses. Vertical alignment marks are provided, such that the base lamina overhangs the tops of the cut-outs between tabs of the overlay lamina in the next lower course. A plurality of horizontal laying marks, differently spaced, are provided to create a program in laying, which insures the avoidance of repetitive or directional patterning.

3,624,976
LENS BLOCK AND ADAPTOR THEREFOR
Richard J. McCall, Summer Hill, and Robert C. Irwin, Stony Creek Township, Cambria County, Pa., assignors to Shuron/Continental Division of Textron Inc., Rochester, N.Y.
Original application May 1, 1967, Ser. No. 635,232, now Patent No. 3,522,677. Divided and this application Mar. 21, 1969, Ser. No. 834,184
Int. Cl. B24b *41/06*
U.S. Cl. 51—216 **4 Claims**



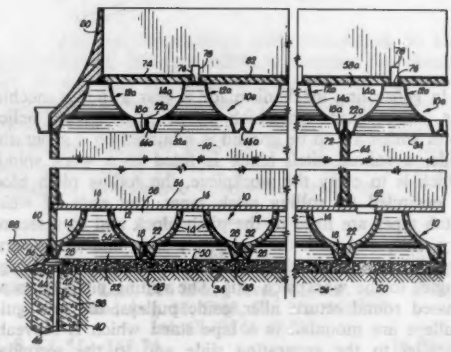
A lens block provided with reference surfaces which locate the lens horizontal layout line and permit the blocked lens to be properly chucked, either directly or by an adaptor positioned on the block, in a lens edge grinding machine for rough edging the lens before generating the same employing the same block used for generating the lens to prescription. The reference surfaces are provided on the molded low melting point metal type block by a lens blocking apparatus having mating reference mold surfaces on the interior walls of the mold cavity.

3,624,977
RECESSED CONDUIT CONSTRUCTION
Evans T. Morton, Pompano Beach, and Tony R. Fitzgerald, Fort Lauderdale, Fla., assignors to Behring Corporation, Fort Lauderdale, Fla.
Filed Jan. 9, 1970, Ser. No. 1,769
Int. Cl. E04b *1/348, 5/48*
U.S. Cl. 52—221 **8 Claims**



A recessed conduit construction for buildings, particularly modular homes and the like, wherein a wall and floor define a horizontally extending recess, and conduit means extends from outlets in or adjacent to the wall and enters into the recess at floor level and extends horizontally in the recess adjacent the frame structure but not interfering therewith. Preferably, the conduit means crosses corners between walls through a recess in the underside of the flooring.

3,624,978
MONOLITHIC STRUCTURAL MEMBER FOR FOUNDATION OR CEILING SYSTEM
Jerald Paul Skinner, Topeka, Kans., assignor to Mono, Inc., Topeka, Kans.
Filed Sept. 25, 1969, Ser. No. 861,009
Int. Cl. E04b *1/62, 5/14*
U.S. Cl. 52—265 **11 Claims**



A structural member for foundation or ceiling systems comprising a monolithic body of sheet material, preferably composed of a synthetic resin that may be readily

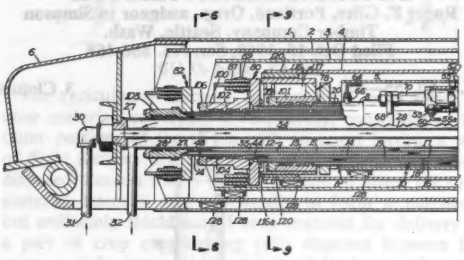
shaped by vacuum forming or other suitable techniques. Aligned rows of hollow, quadrilateral, generally frustopyramidal elements project upwardly from the base plane of the body and present spaced, load-supporting surfaces that define the mounting centers for the overlying floor or roof. Accordingly, the base of the body presents a grid of surfaces on its underside at the mouths of the cavities formed by the hollow support elements. In a foundation system, the base grid directly overlies a pad of sand, silt or gravel chips to seal each individual cavity and thereby trap air therein to establish air pockets of resistance to load. A single chamber is formed beneath the overlying floor between the upstanding support elements to provide a network of intercommunicating chases for plumbing and electrical runs, and define a duct beneath substantially the entire floor for heating and air-conditioning purposes.

3,624,979

TELESCOPING HYDRAULIC CYLINDER ARRANGEMENT FOR MULTIPLE SECTION EXTENSIBLE BOOMS

Daniel F. Przybylski, 636 W. Lake St., Winona, Minn. 55987

Filed Aug. 25, 1969, Ser. No. 852,850
Int. Cl. E04h *12/34*
U.S. Cl. 52—115 **13 Claims**



A plurality of telescopically arranged hydraulic cylinders having piston surfaces of successively decreasing cross-sectional area are utilized to extend and retract a multiple-section, telescopic structure such as a crane boom. A continuous circuit for the flow of hydraulic fluid to and from the hydraulic cylinders takes the form of interconnected annular passages provided between adjacent, radially spaced wall segments of the hydraulic cylinders. The innermost and smallest diameter hydraulic cylinder is stationary, and the outermost, largest diameter hydraulic cylinder moves outwardly first by hydraulic pressure and carries with it the crane boom section of smallest cross sectional area to which it is connected. Full retraction of the crane boom and hydraulic cylinders to a very compact assembly is provided by connecting each of the successively smaller hydraulic cylinders to a boom section of larger cross sectional area, whereby the smallest, movable hydraulic cylinder is connected at its inner end to the inner end of the boom section of largest cross sectional area.

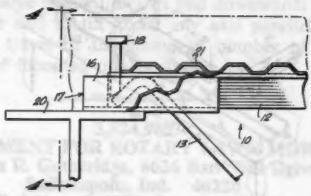
3,624,980

COMPOSITE END CONNECTION FOR STEEL JOISTS

Ira J. McManus, 39 Lincoln Ave., Florham Park, N.J. 07940

Filed Feb. 11, 1970, Ser. No. 10,399
Int. Cl. E04b *1/16, 5/29*
U.S. Cl. 52—327 **9 Claims**

A composite action joist end interconnection with a supporting beam and carrying a concrete slab is described. An outwardly-extending end portion of the top chord of a steel joist is provided at the underside with bearing means adapted to seat upon and be secured to the supporting beam, whereby, when the supported concrete slab is poured in place in such manner as to extend over and



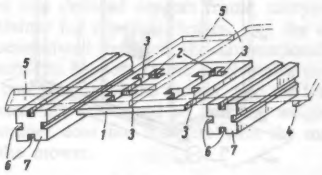
upon the supporting beam, the joist end interconnection therewith is encased within the slab concrete to effect the composite action between the supporting steel and the concrete.

3,624,981

JOINING SYSTEM FOR WALL ELEMENTS

Artur Fischer, Altheimer Strasse 219, Tumlingen, Germany, and Siegfried Mrowka, Sulz Neckar, Germany; said Mrowka assignor to said Fischer

Filed Sept. 9, 1969, Ser. No. 856,350
Claims priority, application Germany, Sept. 10, 1968, P 17 84 713.1
Int. Cl. E04b *1/60*
U.S. Cl. 52—460 **5 Claims**



Structural elements for erecting wall structures have exposed faces provided with first grooves. Cladding plates for cladding the wall structures have projections which are receivable in the grooves of the structural elements. Connecting elements for connecting adjacent ones of the cladding plates are provided with a plurality of grooves at least two of which extend crosswise of one another and which are all dimensioned to receive projections of the cladding plates.

3,624,982

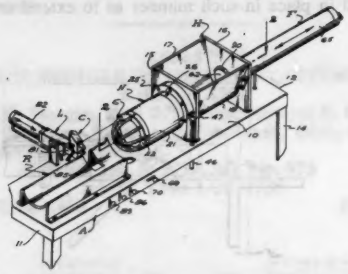
VACUUM PACKING APPARATUS

James W. Marietta, Jr., % D-Mar Co., 1116 W. 24th St., Los Angeles, Calif. 90007

Filed Dec. 15, 1969, Ser. No. 885,043
Int. Cl. B65b *31/04*
U.S. Cl. 53—79 **23 Claims**

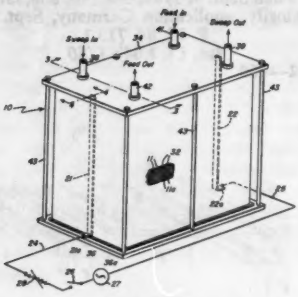
A machine for vacuum packaging items of irregular shape and size in tubular flexible plastic film comprising a tubular neck with open front and rear ends about which a supply of tubular film stock is engaged, means spaced forward of the neck to tie, clip or seal the front end of the film stock in closed condition, means for urging an item to be packaged forward into the rear end of, through and from the front end of the neck and suction means at the front end of the neck to evacuate fluid and air from between the film stock and the item as the item and

film stock moves forwardly from the neck, said means to tie, clip or seal the front end of the film stock closed and



adapted to similarly close the portion of the film stock adjacent the rear end of the packaged item.

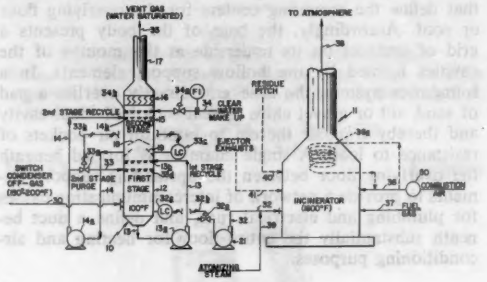
3,624,983
MEANS FOR RAPID AND UNIFORM HEATING OF A PACKAGED MEMBRANE SYSTEM
William J. Ward III, Schenectady, N.Y., assignor to General Electric Company
Filed Mar. 2, 1970, Ser. No. 15,679
Int. Cl. B01d *59/12*
U.S. Cl. 55—16 **6 Claims**



An arrangement for electrically heating a packaged flat-sheet membrane system is described. In the preferred construction the membrane package consists of a plurality of spaced electrically conducting immobilized liquid membranes disposed in substantially parallel surface-to-surface array in combination with manifolding means so as to define both a first group of flow volumes and a second group of flow volumes alternating between the first group. Electrical conductors are connected to make electrical contact with each liquid membrane. These electrical conductors may be connected to an alternating current power supply in a circuit containing an intervening switch. Heating of the packaged membrane system to optimum operating temperatures is accomplished by passing A.C. current through the liquid membranes.

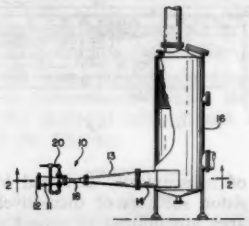
3,624,984
METHOD AND APPARATUS FOR REMOVAL OF ORGANICS FROM CHEMICAL WASTE GASES
Domenic C. Ferrari, Winchester, and Carl G. Bertram, Brighton, Mass., assignors to The Badger Company Inc., Cambridge, Mass.
Filed June 15, 1970, Ser. No. 46,088
Int. Cl. B01d *47/12*
U.S. Cl. 55—85 **26 Claims**

Chemical effluent waste gases from chemical plants, particularly effluent waste gases from phthalic anhydride and maleic anhydride plants, are effectively water washed of residual organic matter (98 to 99% removal) in a wet scrubber using recycled water to concentrate the organic pollutants in the scrubber liquor. A concentrated liquid



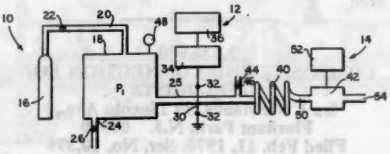
purge (blowdown) from the scrubber recycle circulating loop is directed to a thermal incenerator where the purge is vaporized and the organic pollutants are oxidized to non-pollutant products.

3,624,985
METHOD OF REMOVING POLLUTANTS FROM INDUSTRIAL EXHAUST PRODUCTS
Roger F. Giles, Portland, Oreg., assignor to Simpson Timber Company, Seattle, Wash.
Filed Oct. 15, 1969, Ser. No. 866,468
Int. Cl. B01d *47/10*
U.S. Cl. 55—85 **3 Claims**



A method of pollutant removal employs the step of accelerating the particles through a scrubbing liquid in a venturi scrubber and selectively changing the acceleration by changing the removable throat section according to the size of the particles in the industrial exhaust products being treated.

3,624,986
FLOW CONTROLLER FOR CARRIER GAS CHROMATOGRAPHY
Gerald R. Shoemake, La Canada, Calif., assignor to California Institute of Technology, Pasadena, Calif.
Filed Sept. 4, 1970, Ser. No. 69,676
Int. Cl. B01d *15/08*
U.S. Cl. 55—197 **15 Claims**



A flow controller for a gas chromatograph includes a hydrogen permeable, palladium containing film interposed between a source of hydrogen carrier gas and the

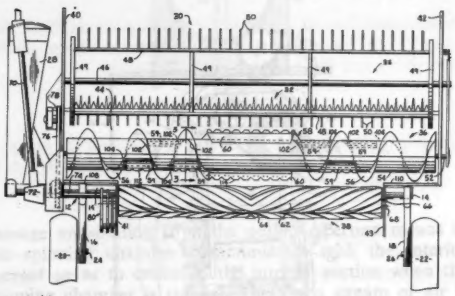
inlet to the chromatograph column. The hydrogen permeability of the film is dependent on its temperature. A variable electrical power supply connected to the film is energized in a programmed manner to heat the film to a selected temperature to control the flow rate of gas through the column.

3,624,987

HAY CUTTING AND CONDITIONING MACHINE

Henry N. Lausch and Bruce D. Schwalm, Leola, Pa., assignors to Sperry Rand Corporation, New Holland, Pa.

Filed Oct. 6, 1969, Ser. No. 864,062
Int. Cl. A01d 43/10
U.S. Cl. 56—1 8 Claims



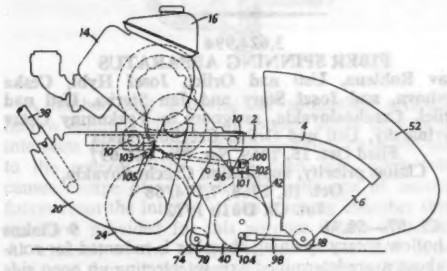
An agricultural machine for cutting a wide swath of crop material, conveying it rearwardly, consolidating the outer portions of the swath with an auger having a pair of flight sections and a plurality of crop deflecting means disposed thereon which are cooperable to direct the crop material laterally and rearwardly to form a narrower, but uniformly thick mat of crop material for delivery to a pair of crop conditioning rolls disposed between the auger and having a length substantially longer than the space formed between the auger flight sections. The swath of crop material that is discharged on the ground after passing through the conditioning rolls has a width at least as great as a major portion of the width of the originally cut swath.

3,624,988

LAWN MOWERS

Edward John Aldred, Ipswich, England, assignor to Ransomes Sims & Jefferies Limited, Ipswich, England

Filed Mar. 11, 1970, Ser. No. 18,681
Claims priority, application Great Britain, Mar. 14, 1969, 13,494/69
Int. Cl. A01d 75/30
U.S. Cl. 56—7 19 Claims



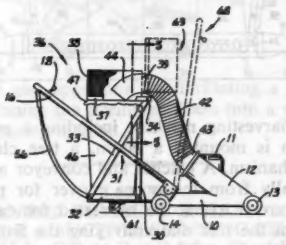
A lawn mower has a cutting unit supported on forward and rear ground-engaging members, and a cutting unit connected to the frame by a pair of laterally spaced connecting members and by a third connecting member vertically spaced from the pair of connecting members. The cutting unit is supported by a single ground-engaging member mounted on the unit rearwardly of its bottom blade and by the three connecting members, which allow the unit to move bodily upwards and downwards relative to the frame and to tilt about any axis parallel to the direction of travel of the frame. A number of cutting units may be mounted on one frame.

3,624,989

ATTACHMENT FOR ROTARY LAWN MOWERS

Marvin R. Gatheridge, 6626 Barr Will Drive, Indianapolis, Ind. 46220

Filed Nov. 2, 1970, Ser. No. 85,862
Int. Cl. A01d 35/22
U.S. Cl. 56—202 8 Claims



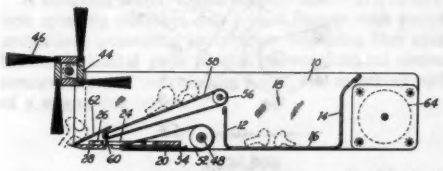
Disclosed is a castered support frame, carrying a collecting container for clippings, leaves, etc., the container being accommodated between the conventional mower handle arms. The support frame is pivotally coupled to the lower, rear portion of the mower, and the frame supporting casters are positioned so that the weight of the loaded container does not interfere with the maneuverability of the mower.

3,624,990

MACHINE FOR HARVESTING MUSHROOMS

James W. Sinden, Zurich, Switzerland, and Gerald J. Stout, State College, Pa., assignors to Blueberry Equipment, Inc., South Haven, Mich.

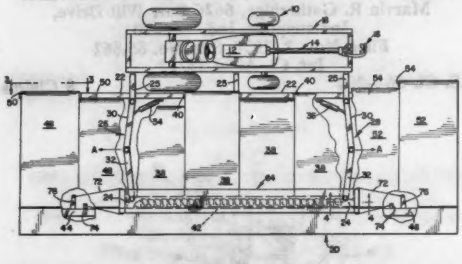
Filed Oct. 15, 1970, Ser. No. 81,066
Int. Cl. A01d 45/00
U.S. Cl. 56—327 R 7 Claims



A rectangular frame is supported from the growing bed by crawler belts arranged in transversely spaced, longitudinally extending loops. A cutter bar is supported in front of the belts by transversely angled, horizontal, spring arms. A first motor with eccentric drive rapidly oscillates the cutter along its length. A rotating cylindrical brush located over the cutter bar brushes the crop against and rearwardly over the cutter. A collector belt inclined rearwardly and

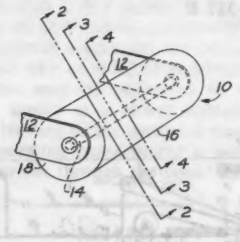
upwardly receives the cut crop and delivers it over the top of a receptable located within the rear end of the frame. A second motor drives the crawler belts, the brush and the collector belt.

3,624,991
FRUIT CATCHER AND CONVEYOR ASSEMBLY
Calvin P. Rickerd, 523 N. Catherine, La Grange, Ill. 60525
Filed June 4, 1970, Ser. No. 43,491
Int. Cl. A01g *19/06*
U.S. Cl. 56—329 **6 Claims**



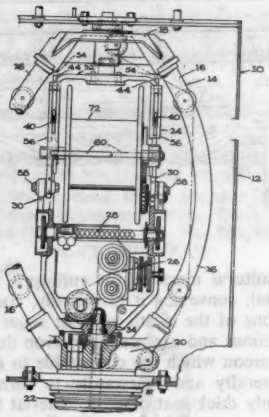
A fruit harvesting machine including a prime mover upon which is mounted a boom, a tree clamp, and a shaker mechanism. A catcher and conveyor assembly extends laterally from the prime mover for powered extension toward a tree to be harvested for catching fruit shaken from the tree and conveying the fruit to a suitable collection point. The assembly is arranged for powered retraction to a transport position. A conveyor of the assembly is covered by a deflector strip to prevent tree-borne fruit from falling directly onto the conveyor. The deflector strip is mounted in a manner whereby it can be raised to a position in spaced relation above the conveyor to permit fruit to move beneath the deflector strip and onto the conveyor.

3,624,992
ELECTROSTATIC YARN PIECING DEVICE AND METHOD
Herbert W. Brown, Easley, S.C., assignor to Maremont Corporation, Chicago, Ill.
Filed Mar. 2, 1970, Ser. No. 15,639
Int. Cl. D01h *15/00*
U.S. Cl. 57—34 R **25 Claims**



In combination with a yarn piecing device having a protrudable nosepiece for offering one end of broken yarn to another, a yarn-attracting, electrostatically charged nosepiece member and an electrostatic yarn piecing method are disclosed. The yarn ends, whether aligned or with off-set threadlines, are pieced by enhanced electrostatic attraction therebetween. In operation, one end releasably held on said member is advanced to piecing proximity of said other end, the ends being then drawn together by enhanced electrostatic attraction, the held end is released and the ends piece themselves to form a continuous yarn strand. The nosepiece member may inherently possess a yarn-attracting electrostatic charge, as is the case when it is formed from polytetrafluoroethylene and the ends to be pieced are cotton. Alternately, the nosepiece member may be electrostatically charged prior to or concurrently with the piecing operations by some charging source or device.

3,624,993
LOCKING DEVICE FOR WIRE TWISTING MACHINE
Charles F. van Hook, 2–31 Lyncrest Ave., Fairlawn, N.J. 07410
Filed Aug. 5, 1969, Ser. No. 847,576
Int. Cl. B65h *49/36, 49/26*
U.S. Cl. 57—58.52 **9 Claims**

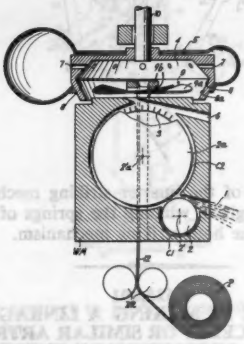


A locking device for a wire twisting machine comprising a pair of latch arms adapted to be pivotally connected to the stationary cradle of a wire twisting machine and a pair of vertical rod members secured at their lower ends to said latch arms with biasing means mounted on said rod members to normally urge said latch arms in a downward direction. A pair of locking arms pivotally connected at their lower ends to the cradle of a wire twisting machine with said locking arms having slots therein adapted to receive the free end of said latch arms therein securing a spool on the cradle of the wire twisting machine with said rod members having elongated upper ends thereon adapted to be disposed in the path of rotation of the flyer of the wire twisting machine when said latch arms are in an unlocked position.

3,624,994
FIBER SPINNING APPARATUS
Vaclav Rohlena, Usti nad Orlici, Josef Hybl, Ceska Trebova, and Josef Stary and Jan Sterba, Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia
Filed Oct. 15, 1969, Ser. No. 866,697
Claims priority, application Czechoslovakia, Oct. 18, 1968, 7,174/68
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 **9 Claims**

A hollow rotary spinning chamber is mounted for rotation about a predetermined axis intersecting an open side of the spinning chamber normal to the general plane of the open side. The spinning chamber has an inner annular surface which surrounds the open side concentric with

the axis of rotation which first diverges and thereupon converges in direction inwardly away from the open side. A separating roller is mounted for rotation proximal to the open side and receives fibrous sliver which it separates into the individual fibers thereof. A passage connects the separating roller with the open side of the spinning chamber and has an outlet located at this open side, fibers passing from the separating roller through the



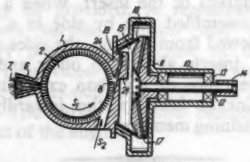
passage and issuing from the outlet. Aperture means in the spinning chamber communicates with the interior thereof so as to create in the interior suction when the spinning chamber is rotated. Thereby a stream of air is drawn through the passage, carrying along the fibers into the spinning chamber. Directing means is provided for directing the stream of air with the fibers carried thereby in such a manner that the fibers are deposited on the inner annular surface in a region of the latter which is inwardly proximal to the open side of the spinning chamber.

3,624,995

METHOD AND DEVICE FOR SPINDLELESS SPINNING

Jaroslav Rajnoha, Tyniste nad Orlici, and Ladislav Bures, Usti nad Orlici, Czechoslovakia, assignors to Elitex Zavody Textilniho Strojirenstvi Generalni, Liberec, Czechoslovakia

Filed Feb. 18, 1970, Ser. No. 12,191
Claims priority, application Czechoslovakia, Feb. 20, 1969, 1,183/69
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 **10 Claims**



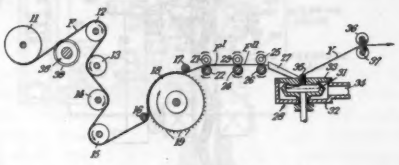
A method and a device for spindleless spinning. A hollow spinning chamber is rotated about an axis which intersects an open side of the spinning chamber normal to the general plane of the open side. Such rotation causes escape of air under the influence of centrifugal forces from the interior of the spinning chamber through apertures provided for this purpose in the wall thereof. As a result of the escape, a continuous flow of air is aspirated through the open side. A stream of fibers is fed into the open side and is centrifugally deposited on the inner circumferential surface of the chamber and converted into a yarn. A pulsing motion is superimposed upon the flow of air before the latter can escape through the apertures to thereby dislodge and eject with the flow of air such particulate contaminants as tend to accumulate in the chamber and in the apertures.

3,624,996

SPINNING OF TEXTILE YARNS

John Michael Shepherd, Ramsbottom, and Robert Greenwood, Whalley, England, assignors to T.M.M. (Research) Limited, Lancashire, England

Filed Aug. 8, 1969, Ser. No. 848,565
Claims priority, application Great Britain, Aug. 16, 1968, 39,281/68
Int. Cl. D01h *1/12*; D02g *3/06*
U.S. Cl. 57—58.91 **12 Claims**



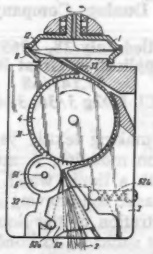
A method and apparatus for fibrillating a plastic film and then spinning the fibrillated fibers into a yarn by the open-end spinning method.

3,624,997

SELF-CLEANING COMBING ROLLER ARRANGEMENT FOR A SUCTION SPINNING CHAMBER

Stanislav Didek, Ctibor Doudlebsky, Stanislav Kabele, Josef Stary, and Milos Vecera, Usti nad Orlici, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Orlici, Czechoslovakia

Filed Nov. 20, 1969, Ser. No. 878,370
Claims priority, application Czechoslovakia, Nov. 21, 1968, 7,924/68; May 16, 1969, 3,490/69
Int. Cl. D01h *1/12*
U.S. Cl. 57—58.91 **22 Claims**



A combing roller which supplies fibers to a rotary suction spinning chamber, has lateral flanges with peripheral projections generating air currents inhibiting fiber accumulations in lateral gaps formed between lateral convex or concave faces of the combing roller, and matching surfaces of a supporting body.

3,624,998

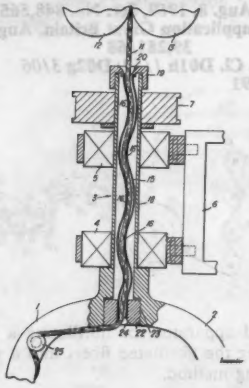
TEXTILE FLYERS

John Kay Pringle Mackie, Belfast, Ireland, assignor to James Mackie & Sons Limited, Belfast, Ireland

Filed Mar. 9, 1970, Ser. No. 17,570
Claims priority, application Great Britain, Mar. 12, 1969, 13,045/69
Int. Cl. D01h *7/26*
U.S. Cl. 57—115 **12 Claims**

A flyer for winding packages of textile roving and of the type having an axial portion extending in the opposite

direction from the legs of the flyer so as to be capable of journalling in one or more bearings has the axial portion formed along its length with a passage having a configuration such that the rove follows a devious path. The resultant changes of direction cause the fibres to be pressed together laterally thus binding them together and permitting considerably greater tension to be applied to



the rove thus rendering it possible to wind rove with very low twist with considerably greater tension than previously so as to form a firm package. The devious path may be formed either by a helical groove in a central member fitted within an outer shell or by means of a tube shaped to a sinuous configuration and mounted within an outer shell.

3,624,999

REINFORCING YARNS OR CORDS

Maurice A. Young, Lichfield, Staffordshire, England, assignor to The Dunlop Company Limited, London, England

No Drawing. Filed July 28, 1969, Ser. No. 845,587
Claims priority, application Great Britain, Aug. 3, 1968, 37,147/68
Int. Cl. D02g *3/36, 3/40, 3/48*
U.S. Cl. 57—153 **11 Claims**

A method for making textile yarns or cords of enhanced compression modulus. A multifilament low-twist yarn is coated with a liquid which can subsequently be converted to an elastic solid having a high Poisson's ratio, the depth of penetration of the liquid into the low-twist yarn being at least sufficient to bond together 30 percent of the filaments composing the yarn, converting the liquid into the elastic solid to form a yarn according to the invention or twisting two or more coated yarns together and converting the liquid into the elastic solid to form a cord.

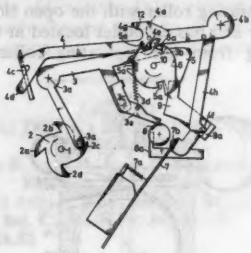
3,625,000

AUTOMATIC WINDING MECHANISM FOR QUARTER HOUR STRIKING CLOCKS

Richard Hermle, Gosheim, Germany, assignor to Franz Hermle & Sohn, Gosheim, Germany

Filed May 4, 1970, Ser. No. 34,473
Claims priority, application Germany, May 2, 1969, P 19 22 405.6
Int. Cl. G04c *1/04*
U.S. Cl. 58—41 **23 Claims**

A clock having a cam means controlled quarter hour striking mechanism and springs for the clockwork drive and the hour striking mechanism, in which the quarter hour striking mechanism is operated by an electromotor supplied with power, for instance from a battery, and in which a switch in the electric circuit connecting the battery to the motor is operated by the cam means controlling the quarter hour striking mechanism to energize the motor



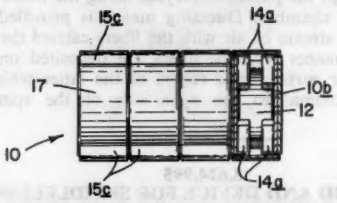
during operation of the quarter striking mechanism, the motor when energized, winding the springs of the clockwork drive and the hour striking mechanism.

3,625,001

LINK FOR USE IN MAKING A LINKAGE FOR A WATCH BRACELET OR SIMILAR ARTICLE AND EXPANSIBLE LINKAGE MADE THEREFROM

Paul Levinger, Providence, R.I., assignor to Textron Inc., Providence, R.I.

Filed May 13, 1970, Ser. No. 36,922
Int. Cl. F16g *13/24*
U.S. Cl. 59—79 R **12 Claims**



A link for use in making a linkage for a watch bracelet or similar article and an expansible linkage made from a series of such links. Each link includes an inner link having top, side and bottom walls. An ornamental insert is positioned above the top wall of each inner link and at least its upper portion is wider than the top wall of the inner link. The insert is secured to the inner link by a retaining member which has inwardly extending end flanges which engages the upper surfaces of outwardly extending end members of the insert. When a plurality of such links are assembled side by side in a linkage and the linkage is viewed from the top, the sides of the upper portions of the inserts abut each other and the inserts present the appearance of a ribbon extending longitudinally of the linkage between the inwardly extending flanges of the retaining members.

3,625,002

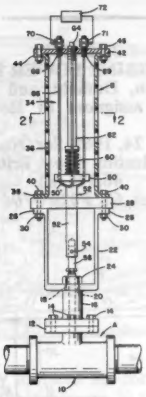
ELECTRICAL ACTUATOR

Noel Davis, Russell Township, Geauga County, Ohio, assignor to Integrated Development and Manufacturing Co., Chagrin Falls, Ohio

Filed Oct. 21, 1969. Ser. No. 868,115
Int. Cl. F03g *7/06;* **F16k** *31/02*
U.S. Cl. 60—23 **7 Claims**

The drawings disclose an electrical actuator for valves, controls, and the like. The actuator shown comprises a drive plate adapted to act against a driven member. The drive plate is continuously biased in a first direction by an adjustably mounted spring. At least one elongated resistance wire member is connected with the plate to act

against the spring. Additionally, means are shown for supplying electric current to wire member to cause it to



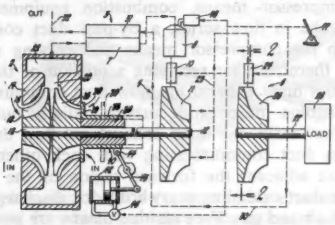
expand or contract to produce controlled movement of the drive plate.

3,625,003

SPLIT COMPRESSOR GAS TURBINE

Sidney G. Liddle, Troy, and Mason K. Yu, Birmingham, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 8, 1970, Ser. No. 70,201
Int. Cl. F02c *9/14*; F02g *3/00*
U.S. Cl. 60—39.25 **9 Claims**



A gas turbine engine has a double-entry centrifugal compressor, combustion apparatus supplied by the compressor, and a turbine having variable nozzle area supplied from the combustion apparatus and driving the compressor. The turbine may drive the load or a second power turbine in series with the compressor driving turbine may be provided. A regenerator to exchange heat between turbine exhaust and compressed air is preferably provided. One side of the double-entry compressor is provided with a shut off valve which closes the entrance to this side for operation at idling and under light loads. The valve is opened completely for higher power output of the engine.

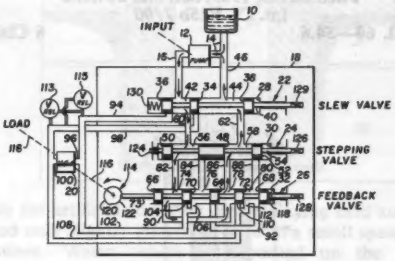
3,625,004

HYDRAULIC DRIVE CONTROL APPARATUS

Werner G. Holzbock, Bloomfield Hills, and Wade R. Brown, Southfield, Mich., assignors to Eaton Yale & Towne Inc., Cleveland, Ohio

Original application July 5, 1968, Ser. No. 742,674, now Patent No. 3,568,713, dated Mar. 9, 1971. Divided and this application Nov. 20, 1969, Ser. No. 870,453
Int. Cl. F15b *15/18*
U.S. Cl. 60—53 R **9 Claims**

Disclosed herein in control apparatus for a hydraulic drive arrangement providing the drive arrangement with standby, intermittent, and continuous modes of operation. A fluid pressure source, hydraulic motor, and control apparatus for regulating fluid flow between the fluid source and the motor form the drive arrangement. The control apparatus includes a plurality of flow paths through the apparatus, a plurality of valves disposed in the flow paths with each valve having a plurality of operating positions, and structure for operating the valves to move the valves between the various operating positions to regulate fluid



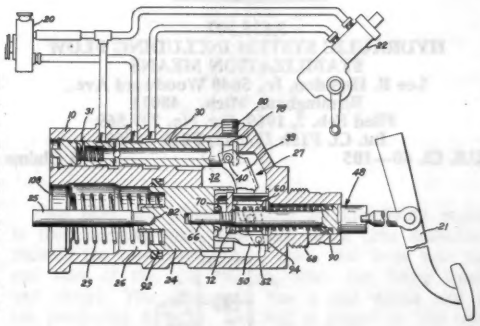
flow through the control apparatus. A mechanical feedback loop operable in response to a predetermined angular incremental advance of the motor controls the operating position of one of the valves whereby the motor may be utilized for the positioning of a driven member or load accurately and rapidly either in a series of predetermined increments or in a single continuous operation.

3,625,005

ACTUATING MEANS FOR A BRAKE BOOSTER

Cloyde E. Saunders and Richard W. Euler, South Bend, Ind., assignors to The Bendix Corporation

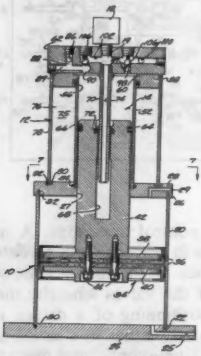
Filed May 8, 1970, Ser. No. 35,800
Int. Cl. F15b *7/00*, *13/10*; G05g *1/04*
U.S. Cl. 60—54.6 **9 Claims**



A valve actuating mechanism for varying the applied force transmitted to a control valve and a power piston, which includes a support member fixed to the power piston. A lever with elongated slots in its arms is pivotally pinned to the support bracket and secured to the control valve by pins retained in a groove. A force transmitting member carried on an activating rod is connected to the lever by pivot pins slidably retained in the elongated slots. When force is applied by the activating rod, the force transmitting member with the pivot pins being free to move in the slots of the lever arm transmits a force to the piston and valve in proportion to the position of the pivot pins on the lever arm. Thus, the distance

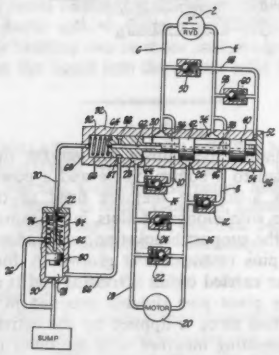
traveled by the piston and valve in being actuated will vary in proportion to the distance traveled by the force transmitting member and its location on the lever arms.

3,625,006
TWO-STAGE HYDRAULIC BOOSTER
Thomas J. Schoenleben, Racine, Wis., assignor to Tomco, Inc., Racine, Wis.
Filed Oct. 8, 1969, Ser. No. 864,682
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.6 **6 Claims**



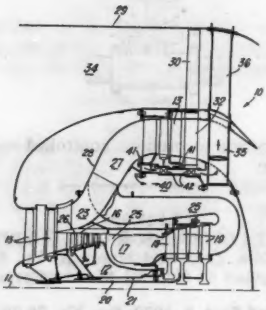
An air actuated two-stage hydraulic booster including an air actuated piston and cylinder assembly and a low pressure hydraulic piston and cylinder assembly actuated by the air actuated assembly, a high pressure piston and cylinder assembly incorporated within the low pressure hydraulic assembly and a pressure responsive relief valve to release the pressure in the low pressure assembly to provide a single shot of high pressure fluid from the high pressure assembly.

3,625,007
HYDRAULIC SYSTEM INCLUDING FLOW STABILIZATION MEANS
Lee R. Herndon, Jr., 5640 Woodward Ave., Birmingham, Mich. 48011
Filed Feb. 7, 1969, Ser. No. 797,569
Int. Cl. F15b *13/042;* **F01k** *13/02*
U.S. Cl. 60—105 **6 Claims**



A hydraulic system including a hydraulic motor with means for controlling the pressure in the intake line of the motor to prevent cavitation and elastic compression of the hydraulic oil when the load on the motor increases.

3,625,008
GAS TURBINE POWER PLANT
Colin Taylor Hewson, Duffield, and John A. H. Scott, Derby, England, assignors to Rolls-Royce Limited, Derby, England
Filed Sept. 24, 1969, Ser. No. 860,728
Claims priority, application Great Britain, Sept. 27, 1968, 46,076/68
Int. Cl. F02k *3/04*
U.S. Cl. 60—226 **6 Claims**

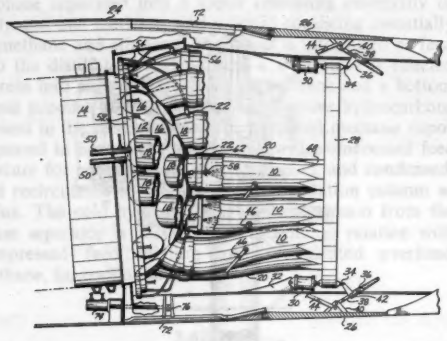


A gas turbine power plant including a gas turbine engine having compressor means, combustion equipment and turbine means in flow series, a by-pass duct communicating with the compressor means and curving radially outwardly therefrom for receiving a portion of the compressed air, a main exhaust gas flow duct communicating with the turbine means and curving radially outwardly and then forwardly, the main exhaust gas flow duct and the by-pass duct communicating with each other and a further duct adjacent the forward region of the engine, the further duct extending rearwardly for discharging the mixture of air and gas. Free turbine means are positioned in the further flow duct and carry a fan and since the free turbine means is subjected to a relatively cool fluid, it may be made of light weight metal. The free turbine means, by reason of the particular arrangement of ducts, is located within the axial extent of the gas turbine engine whereby the power plant is particularly adaptable for VTOL aircraft.

3,625,009
MULTI-TUBE NOISE SUPPRESSOR PROVIDING THRUST AUGMENTATION
George S. Schairer and Ross W. Colebrook, Bellevue, Wash., assignors to The Boeing Company, Seattle, Wash.
Filed June 5, 1970, Ser. No. 43,888
Int. Cl. F02k *1/26, 3/08*
U.S. Cl. 60—261 **16 Claims**

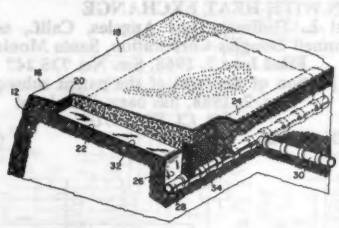
A noise suppressor having a plurality of exhaust tubes, for receiving jet engine exhaust gases, movable between a first close packed position, wherein the tubes discharge exhaust gases in a single composite jet within a surrounding tubular nacelle, where one is employed; and a second radially deployed position, wherein the exhaust gases are discharged as separated jets with the outer peripheral tubes discharging separate jets through openable apertures in the nacelle wall; and having fuel nozzles and flame holders positioned interiorly of the exhaust tubes for selectively introducing and burning fuel within the tubes for thrust augmentation. Cooling liners are provided in-

side the exhaust tubes to cool the wall surfaces and tertiary air doors are provided in the nacelle upstream of



the tubes to supply ambient air for mixing with the exhaust gases when the tubes are in the deployed position.

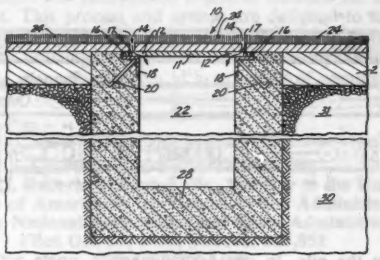
3,625,010
SYSTEM AND METHOD FOR PREVENTING EROSION
Ralph W. Hakundy, 4741 N. Ridge E., Ashtabula, Ohio 44004
Filed Feb. 27, 1970, Ser. No. 14,952
Int. Cl. E02b *11/00*
U.S. Cl. 61—10 **8 Claims**



A system and method for preventing erosion of an embankment in which a shallow excavation about nine feet in width is dug in the ground along the top of the embankment, spaced slightly back from the embankment edge. A trench deeper than the excavation is dug along the rearmost side of the excavation remote from the edge of the embankment. The bottom of the excavation is sloped gently in the direction of the trench and a water impervious plastic sheet is laid covering the bottom. Drain tile is placed in the bottom of the trench and covered with granular material such as crushed stone. The excavation and trench are then covered with topsoil. Water soaking into the soil close to the embankment is caused by the plastic sheet to drain away from the embankment edge and is collected by the tile.

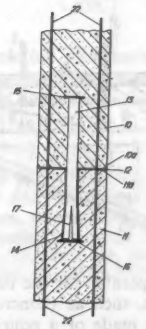
3,625,011
DRAINAGE SYSTEM
William W. Stevenson, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed Apr. 15, 1970, Ser. No. 28,798
Int. Cl. E02b *11/00*; E01c *13/00*; A63c *19/04*
U.S. Cl. 61—11 **8 Claims**

A covered drainage system for the removal of water from an athletic playing field having an artificial surfacing thereon, comprising, in combination, drainage means below the surface of the playing field and proximate thereto for receiving and carrying water; a cover for the drainage means adapted to allow water to pass between the adjacent field and the cover and into the drainage means, the cover comprising a substrate surfaced with a sheet of artificial surfacing; and means to removably hold the cover on the drainage means, wherein the strip of artificial surfacing on the cover is adjacent to and level



with the artificial surfacing of the playing field and separated only slightly therefrom to form a small space therebetween. Water, which is deposited on the playing field, passes from the field into the space between the playing field and the cover, providing a pass through of the water into the drainage means below the cover.

3,625,012
SELF-LOCKING PILE JOINT
Samuel Thorburn, Glasgow, Scotland, assignor to Logistics Limited, Great Britain
Filed Nov. 19, 1969, Ser. No. 878,056
Claims priority, application England, Feb. 4, 1969, 6,059/69; May 22, 1969, 26,064/69
Int. Cl. E02b *5/30*; E04b *1/48*
U.S. Cl. 61—56 **12 Claims**

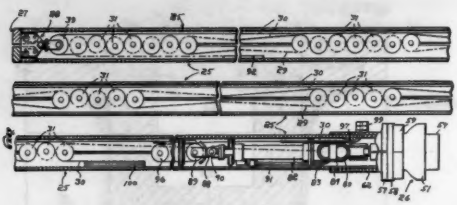


Two piles are joined together by interfitting means in their opposed ends. One pile has a tube embedded therein, the tube having one, open, end flush with the end face of the pile and its other end being flared and closed. The other pile has a rod whose end is cut projecting from it. The rod is placed in the tube and as the pile is driven the cut end is forced by a wedge into the flare of the tube, thus locking the piles together.

3,625,013
EXPANSIBLE MANDRELS FOR USE IN DRIVING OR WITHDRAWING TUBULAR PILES
Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806, and Willard B. Goodman, P.O. Box 62, Newport, Oreg. 97365
Filed June 16, 1970, Ser. No. 46,641
Int. Cl. E02d *7/30*
U.S. Cl. 61—53.72 **11 Claims**

Expansible mandrels are disclosed for use in driving or withdrawing tubular piles. The mandrels comprise sections interconnected by cables in a manner such that a

pull on one cable expands the mandrel so that it will tightly grip the pile into which it has been inserted and a pull on the other cable draws the sections together so that the mandrel may be inserted in or withdrawn



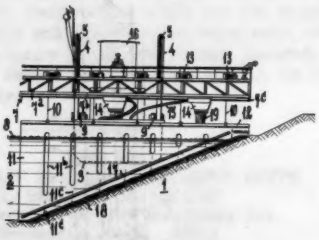
from the pile. In one embodiment, a single acting ram housed within the mandrel controls the expansion cable while in another embodiment of the invention, a double acting ram is used so that both cables can be actuated thereby.

3,625,014

METHOD AND APPARATUS FOR UNDERWATER DEPOSITION OF SETTABLE MATERIALS

Henrikus Frederikus Josephus Marie Hillen, Laan van Meerdervoort, Netherlands, assignor to Prepakt N.V., Gouda, Netherlands

Filed June 11, 1969, Ser. No. 832,275
Claims priority, application Netherlands, June 13, 1968, 6808349
Int. Cl. E02b *3/12, 5/02*
U.S. Cl. 61—72.4 **14 Claims**



A method and apparatus for the underwater deposition of settable materials, such as (concrete) mortar, asphalt and the like. Use is made of a pouring bag or envelope of flexible material, which is moved along with its lower end sliding on the underwater surface to be treated and tends to be constantly flattened by the static pressure of the surrounding water, so that the bag or envelope walls will continuously contract around the material flowing therethrough from a location above water level and consequently braking the free fall of the material. As a result of this the material will leave the lower outlet slot as a slowly outflowing uniform web and the danger of demixing of the outflowing material by the action of the surrounding water is reduced to a minimum.

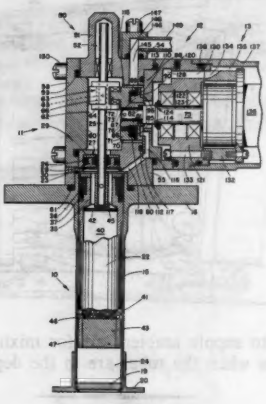
3,625,015

ROTARY-VALVED CRYOGENIC APPARATUS

Fred F. Chellis, Concord, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Apr. 2, 1970, Ser. No. 25,152
Int. Cl. F25b *9/00*
U.S. Cl. 62—6 **9 Claims**

Cryogenic refrigerator of liquefier operating on the cycle of U.S. Pat. 2,966,035. Flow of high-pressure fluid into and withdrawal of low-pressure fluid from the apparatus is controlled by a rotary valve which is readily installed and interchanged, if desired, to alter the timing of the



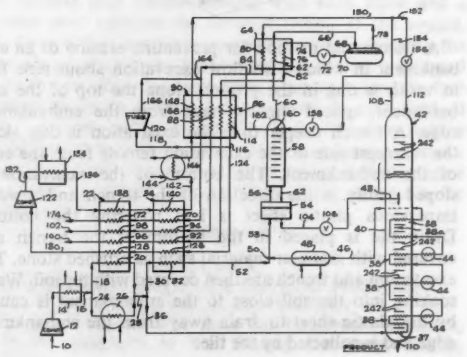
cycle. No valve adjustments are required after assembly of the apparatus.

3,625,016

SEPARATION OF HYDROGEN AND HYDROCARBON MIXTURES BY PLURAL STAGE DISTILLATION WITH HEAT EXCHANGE

Michael L. Hoffman, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed June 7, 1968, Ser. No. 735,247
The portion of the term of the patent subsequent to Dec. 7, 1988, has been disclaimed
Int. Cl. F25j *3/02*
U.S. Cl. 62—26 **13 Claims**



Method and system particularly designed for separating hydrogen and methane, and ethylene, from mixtures thereof, also generally containing heavier hydrocarbons, which involves cooling a compressed feed mixture, e.g., one containing 17% hydrogen, 32% methane, 32% ethylene, and 19% of heavier hydrocarbons including ethane and propylene, to a saturated vapor by heat exchange with cold product gas streams and by external refrigeration, passing the cooled saturated feed vapor mixture in indirect heat exchange relation through the lower portion of a distillation column at several different temperatures levels therein, such feed mixture also being subjected to external refrigeration at several different temperature

levels and affecting a non-adiabatic distillation in the column and a partial condensation of the feed vapor. The exiting partially condensed feed mixture from the column is phase separated into a vapor consisting essentially of hydrogen and methane, and a liquid consisting essentially of methane and ethylene. The liquid is introduced as feed into the distillation column, and a separation is effected therein into an overhead vapor of methane and a bottom liquid product of ethylene and any heavier hydrocarbons present in the feed mixture. The overhead methane vapor is passed in heat exchange relation with compressed feed mixture for cooling same, further cooled, and condensed, and recirculated to the top of the distillation column as reflux. The cold hydrogen and methane stream from the phase separator is passed in heat exchange relation with compressed feed mixture and recirculated overhead methane, for cooling same.

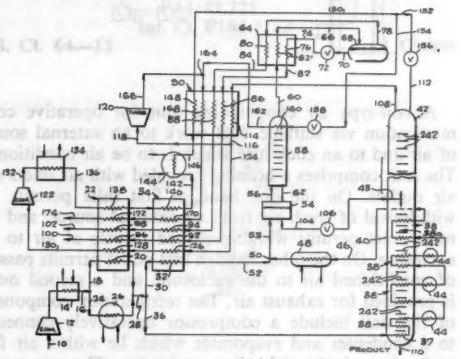
3,625,017
SEPARATION OF COMPONENTS OF HYDROGEN AND HYDROCARBON MIXTURES BY PLURAL DISTILLATION WITH HEAT EXCHANGE

Michael L. Hoffman, Los Angeles, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Continuation-in-part of application Ser. No. 735,247, June 7, 1968. This application Nov. 1, 1968, Ser. No. 772,563

Int. Cl. F25j *3/02*

U.S. Cl. 62—26 **11 Claims**



Method and system particularly designed for separating hydrogen and methane, and ethylene, from mixtures thereof, also generally containing heavier hydrocarbons, which involves cooling a compressed feed mixture, e.g., one containing hydrogen, methane, ethylene, and heavier hydrocarbons including ethane and propylene, preferably to a substantially saturated vapor, by heat exchange with cold product gas streams and by external refrigeration, passing the cooled substantially saturated feed vapor mixture in indirect heat exchange relation with the fluid from the lower portion of a distillation column at several different temperature levels, such feed mixture also being subjected to external refrigeration at several different temperature levels and effecting a non-adiabatic distillation in the column and a partial condensation of the feed vapor. The exiting partially condensed feed mixture from the column is phase separated into a vapor consisting essentially of hydrogen and methane, and a liquid consisting essentially of methane and ethylene. The liquid is introduced as feed into the distillation column, and a separation is effected therein into an overhead vapor of methane and a bottom liquid product of ethylene and any heavier hydrocarbons present in the feed mixture. The overhead methane vapor is passed in heat exchange relation with at least a portion of the compressed feed mixture for cooling same, is further cooled, and condensed, and recirculated to the top of the distillation column as reflux. The cold hydrogen and methane stream from the phase separator is passed in heat exchange relation with compressed feed mixture and recirculated overhead methane for cooling same. This process and system are designed to effect an efficient separation particularly by recovering and effectively utilizing refrigeration in a thermodynamically reversible manner, resulting in a reduction of compressor power cost.

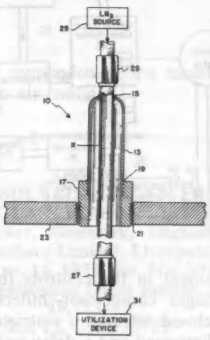
3,625,018
CRYOGENIC FEEDTHROUGH

Edward J. Roberts, Hampton, Va., assignor to the United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Oct. 20, 1969, Ser. No. 867,851

Int. Cl. F16l *5/00*

U.S. Cl. 62—55.5 **2 Claims**



A penetration unit for transferring liquid cryogenics from a source through the chamber wall of a vacuum system to a cryopanel or the like.

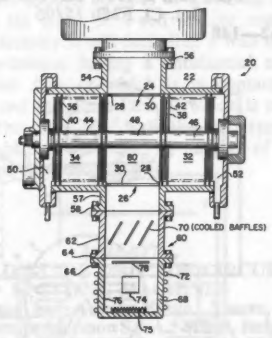
3,625,019
VACUUM PUMP WITH DEMOUNTABLE COLD TRAP AND GETTER PUMP

Gordon E. Osterstrom, Winnetka, Ill., assignor to Sargent-Welch Scientific Company, Skokie, Ill.

Filed Oct. 27, 1969, Ser. No. 869,747

Int. Cl. B01d *5/00*

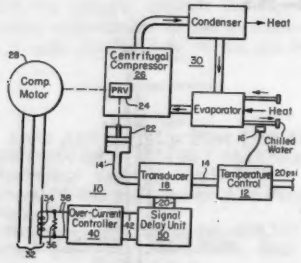
U.S. Cl. 62—55.5 **9 Claims**



A turbo-molecular vacuum pump having a cylindrical casing with at least two large openings therein, one attached to or adapted for connection to a vessel to be evacuated and the other for providing access to a cold trap beneath which is disposed a getter pump, said cold

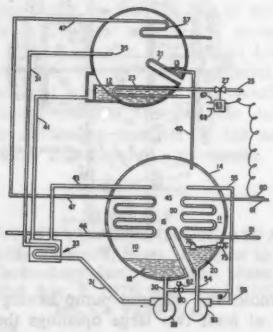
trap and getter pump being arranged in the high vacuum portion of the pump, which consists of the compressor sections disposed oppositely in axial portions of said casing. The cold trap and getter pump are demountably attached, and may be advantageously used where contaminants of the type best removed by the getter pump or cold trap are present in the influent stream.

3,625,020
ELECTRONIC CONTROL FOR CENTRIFUGAL CHILLER WITH PNEUMATIC CONTROLS
Frank A. Kimpel, York, Arthur R. Day III, Camp Hill, and Joseph E. Fleckenstein, Red Lion, Pa., assignors to Borg-Warner Corporation, Chicago, Ill.
Filed June 30, 1970, Ser. No. 51,083
Int. Cl. F25b *41/04*
U.S. Cl. 62—158 **4 Claims**



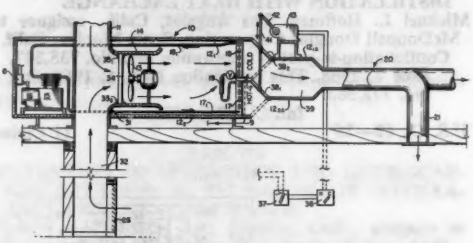
An improvement in the controls for pneumatic controlled centrifugal compressor-chillers of refrigeration systems is disclosed wherein a restrictor in a pneumatic line may be eliminated and a delay unit coupled between an electric motor current controller and a transducer, which transducer alters the pressure in the pneumatic line to change the throttling of the compressor input. The delay unit expands, linearly, the time period of changes in electrical current signal. It also provides different rates of time expansion for positive and negative changes in its input.

3,625,021
OVERLOAD CONTROL FOR ABSORBENT REFRIGERATION SYSTEM
Eddie L. Dyre, Syracuse, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.
Filed Jan. 2, 1970, Ser. No. 82
Int. Cl. F25b *15/06*
U.S. Cl. 62—148 **2 Claims**



An absorption refrigeration system includes an arrangement operable upon the absorbent solution approaching crystallization to render the chilled water sensor inoperable to modulate the heating medium supply valve when the demand load on the system exceeds the capacity of the system, as it is then operating, at the chilled water setpoint temperature, the object of said arrangement being to permit continued effective operation of the system in response to the excess demand load, with a concurrent elevation of the chilled water temperature above the setpoint of the chilled water sensor, and with minimum consumption of heating medium.

3,625,022
AIR CONDITIONING UNIT
John W. Johnson, 12222 Troy St., Baton Rouge, La. 70811
Filed Dec. 23, 1969, Ser. No. 887,710
Int. Cl. F25b *29/00*
U.S. Cl. 62—159 **7 Claims**

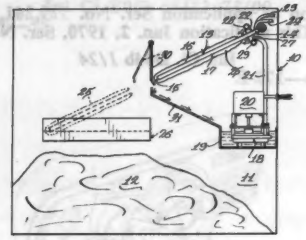


A coil-type air conditioning unit for operative communication via suitable duct work to an external source of air and to an enclosure which is to be air conditioned. The unit comprises a housing provided with air inlets and air outlets. On the one hand, a first inlet permits the withdrawal of fresh air from an external source, and another inlet permits withdrawal and recycle of air to the enclosure. On the other hand, a first outlet permits passage of conditioned air to the enclosure, and a second outlet is provided for exhaust air. The refrigeration components of the unit include a compressor operatively connected to a condenser and evaporator which lie within air flow paths through the air outlets, and a fan. The compressor and fan can be operated by the same or different motors, and means are provided for alternately opening and closing the air outlets to the flow of air delivered by the fan. In a cooling operation, representing one type of operation, air is delivered across the evaporator and cool air is passed into the enclosure while air simultaneously passed over the condenser is exhausted. In a warming type operation, warm air is delivered to the enclosure after passage over the condenser, while simultaneously cold air is exhausted after passage across the evaporator. Automatic controls are provided.

3,625,023
ICE MAKER APPARATUS
Donald F. Swanson and Wynn G. Winkler, St. Paul, Minn., assignors to Whirlpool Corporation
Filed June 13, 1969, Ser. No. 832,914
Int. Cl. F25c *1/12*
U.S. Cl. 62—320 **5 Claims**

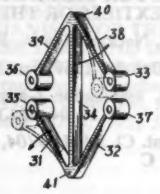
An ice maker particularly of the commercial type comprising a heat conducting refrigerated plate maintained at an angle less than 90° and preferably less than 45° below the horizontal together with means for simultaneously flowing water over the resulting upper and lower inclined side surfaces and the three edge surfaces except for the

on at the upper end to form an envelope sheath of ice open at this upper end and means for releasing the ice sheath from the plate so that it can slide by gravity there-



from. The apparatus also preferably includes a heated cutter grid means in the path of fall intercepting the ice sheath and automatically cutting it into subdivided portions.

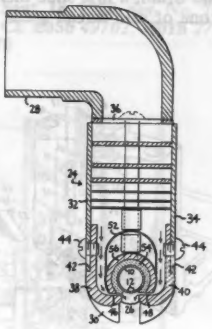
3,625,024
COUPLING
Takefusa Kikuchi, 6–18, 3-chome, Sakai, Musashino, Tokyo, Japan
Filed Feb. 26, 1970, Ser. No. 14,522
Claims priority, application Japan, May 29, 1969, 44/42,221
Int. Cl. F16d *3/62*
U.S. Cl. 64—12 **4 Claims**



A coupling in which a driving flange and a driven flange located face-to-face are coupled by a link mechanism which comprises two V-shaped linkages, each linkage consisting of two bars and a cross bar bridging said V-shape linkages at their apices, one end of each V-shape linkage being pivotally secured to a pin projecting from the driving flange and the other end being pivotally secured to a pin projecting from the driven flange, whereby even when the driving shaft and driven shaft are axially misaligned, motive power is effectively transmitted from the former to the latter without any difficulty.

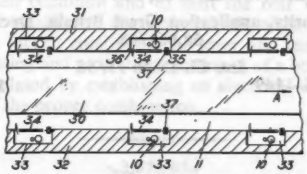
3,625,025
METHOD AND DEVICE FOR FORMING GLASS FIBERS
Thomas H. Jensen, Murrysville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed Nov. 29, 1968, Ser. No. 779,934
Int. Cl. C03b *37/02*
U.S. Cl. 65—2 **6 Claims**

A glass fiberizing device comprises a tubular member having a plurality of orifices therein for extruding steams of glass delivered to the member under pressure. Cooling air is directed across the orifice portion of the member in a direction substantially normal to the direction of glass flow therefrom to prevent flooding of the orifice



portion while the remainder of the member is shielded and insulated from air cooling.

3,625,026
REMOVING DISSOLVED OXYGEN FROM MOLTEN TIN IN A GLASS RIBBON FLOAT BATH
Alan Joseph Cocker, Ormskirk, England, assignor to Pilkington Brothers Limited, Liverpool, England
Filed Apr. 16, 1970, Ser. No. 29,051
Claims priority, application Great Britain, Apr. 17, 1969, 19,723/69
Int. Cl. C03c *18/02*
U.S. Cl. 65—27 **23 Claims**

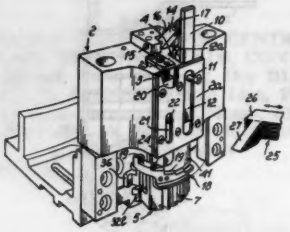


The dissolved oxygen content of a molten metal, e.g. molten tin or tin alloy, is tested and/or controlled by means of an electrolytic cell including a wall of a refractory oxide electrolyte having a substantial oxygen ion conductivity one face of which is in contact with the molten metal and the other face of which is engaged by an electrode. The cell E.M.F. indicates the oxygen content of the metal which is controlled by passage of controlled current through the cell.

3,625,027
THREAD GUIDE UNIT FOR CIRCULAR KNITTING MACHINES
Francesco Piana and Angelo Brega, Varese, Italy, assignors to Mecmor S.p.A., Milan, Italy
Filed Apr. 14, 1969, Ser. No. 815,673
Claims priority, application Italy, Nov. 15, 1968, 829,249
Int. Cl. D04b *9/06, 15/58*
U.S. Cl. 66—19 **6 Claims**

This disclosure relates to a thread guide unit for rapidly replacing one thread with another before commenc-

ing the rows of knitting, said unit comprising a drum oscillating about its own axis and provided with peripheral grooves extending parallel to said axis, said grooves being arranged to house thread guide members, a step cam fast with said drum, a first slide member for causing the lowering of one of said thread guide members, a sec-



ond slide member arranged to engage said step cam and lock said drum, a series of control members equal in number to the number of steps of said step cam, each of said control members being arranged to engage a corresponding step of said cam and cause the rotation of said drum.

3,625,028

METHOD AND MEANS FOR EFFECTING WORK TAKE-OFF IN FLAT BED AND STRAIGHT BAR KNITTING MACHINES

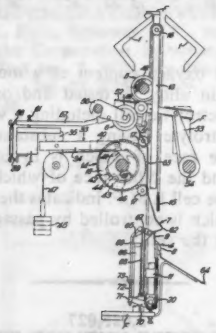
Frederick Raymond Challenger, Loughborough, and John Harry Cuthbertson, Skegby, England, assignors to S. A. Monk (Sutton-in-Ashfield) Limited, Sutton-in-Ashfield, Nottinghamshire, England

Filed Nov. 28, 1969, Ser. No. 880,559

Claims priority, application Great Britain, Dec. 6, 1968, 58,061/68

Int. Cl. D04b *15/88*

U.S. Cl. 66—149 **15 Claims**



Method and means for effecting work take-off in V bed knitting machines, in which initial tension is applied to the fabric being knitted by a hook-up bar, said tension then being taken up by a drawing-off roller assembly, auxiliary means being provided to engage the fabric issuing from said drawing-off roller assembly and to cause said fabric to follow a pre-determined path.

3,625,029

GIRDLE AND METHOD

Sam C. Safrit, Winston-Salem, and Kenneth E. Smith, Rural Hall, N.C., assignors to Separates, Ltd., Winston-Salem, N.C.

Continuation of application Ser. No. 729,261, May 15, 1968. This application Jan. 2, 1970, Ser. No. 130

Int. Cl. D04b *1/24*

U.S. Cl. 66—172 E **4 Claims**

A knitted girdle having two legs, each of which has a stocking supporting portion having vertically spaced circumferentially extending series of bare elastic yarn for engaging and supporting stocking tops during wear.

3,625,030

APPARATUS FOR CHEMICALLY CLEANING TEXTILES OR THE LIKE

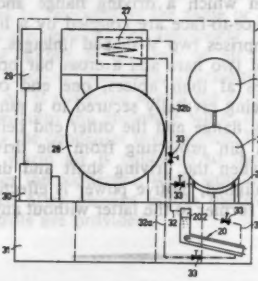
Erwin Biesinger, Neckarhalde 90, Rottenburg, Germany

Filed Oct. 23, 1969, Ser. No. 868,824

Claims priority, application Germany, Oct. 24, 1968, P 18 04 864.1

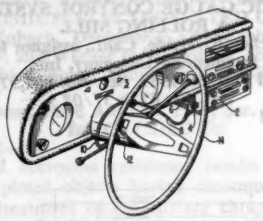
Int. Cl. D06f *39/04, 43/08*

U.S. Cl. 68—18 C **10 Claims**



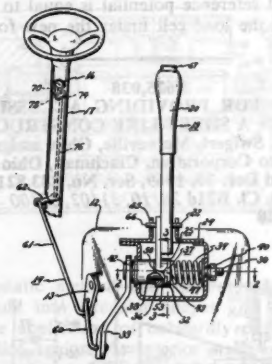
Apparatus for chemically cleaning textiles or the like which is provided with its own, preferably electrically heated, steam-generating means connected to at least one device of the cleaning apparatus which is to be heated by a closed circuit arranged in such a manner that the steam produced by the steam-generating means will flow into the device to heat the latter while the condensate forming in the closed circuit and in the device will flow back into the steam-generating means.

3,625,031
APPARATUS FOR PREVENTING THEFT OF PORTABLE ARTICLES
Granville M. Alley III, P.O. Box 1427, Tampa, Fla. 33601
Filed Sept. 25, 1969, Ser. No. 861,069
Int. Cl. E05b *65/12, 73/00*
U.S. Cl. 70—58 10 Claims



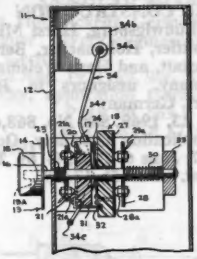
Unauthorized removal of a portable article from a vehicle is prevented by attaching the article to the vehicle steering column with a flexible elongated cable. An adjustably-sized loop at one end of the cable encircles the steering column, and the other end of the cable is connected to a lock which engages a bracket on the portable article. The bracket is attached to the portable article by a fastener which has a threaded shank and a recessed head for receiving a fastener-rotating tool. Access to the recess by a tool is obstructed by a pin on the lock which passes through apertures in the bracket.

3,625,032
COUPLING MECHANISM FOR TRANSMISSION SHIFT SELECTOR HAND LEVER
Earl M. Muhleck, Detroit, Mich., assignor to American Motors Corporation, Kenosha, Wis.
Filed Mar. 19, 1970, Ser. No. 20,978
Int. Cl. B60r *25/06;* G05g *5/06*
U.S. Cl. 70—202 1 Claim



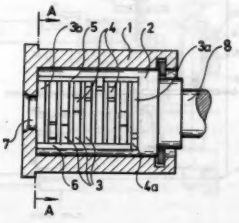
A coupling arrangement interposed between a shift selector hand lever and its connection with a vehicle's drive transmission and a key locking mechanism, the latter being operable to immobilize the shift selector hand lever which when subjected to forcement initiates a camming action in the coupling arrangement to release to free in idle movement the hand lever.

3,625,033
ELECTROMECHANICAL COMBINATION LOCK CONSTRUCTION
Carlos Subieta, Kensington, Md., assignor to Representation Unlimited, Washington, D.C.
Filed Sept. 18, 1970, Ser. No. 73,359
Int. Cl. E05b *49/02;* H01h *27/10*
U.S. Cl. 70—278 11 Claims



An electromechanical combination lock construction, formed of a plurality of dial assemblies having an exterior, manually rotatable dial and a shaft fixed thereto carrying a first wheel of insulating material which has a radial electrical contact formation at a particular angular position thereon, and another wheel member of insulating material which is movable between forward and rearward positions axially of the shaft and carries a spring contact member to engage the confronting face of the first mentioned wheel and close an electrical circuit with the contact formation on the first mentioned wheel at a particular angular position of the dial. An exposed lever, and a cam operated thereby, control certain limit switches and activate a device to mechanically couple the rear wheels with the front wheels for coordinate rotation when the lock is in unlocked condition and to shift the rear wheels to a decoupled relation to the front wheels when the lock is moved to locked condition. The lever and cam also control retracting and projecting movement of a bolt when the latter is relased by establishing an electrical circuit upon dialing of the proper combination.

3,625,034
CYLINDER LOCKS
Into Vilho Sinervo, Helsinki, Finland, assignor to Oy Wartsila AB, Helsinki, Finland
Filed July 2, 1969, Ser. No. 838,491
Claims priority, application Finland, July 5, 1968, 1,938/68
Int. Cl. E05b *9/04, 29/00*
U.S. Cl. 70—366 1 Claim



A cylinder lock comprises a stationary cylinder housing and a cylinder turnable therein. The cylinder encloses a plurality of locking disks which are turnable by means of

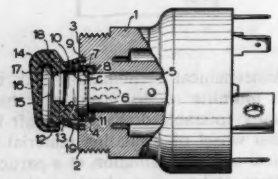
the key of the lock. The torque of the key is transmitted through one or several of said locking disks by means of radial projections engaging one side border of an opening in the side of the cylinder. The torque transmission is arranged in such a way that the cylinder cannot be loaded by turning forces at its other end, that is the end from which the key is inserted.

3,625,035

LOCK CONSTRUCTION

Dietmar Brummer, Ludwigsburg, Horst Mischker, Leonberg, Heinrich Spittler, Hohenacker, Berthold Walter, Stuttgart-Bad Canstatt, and Hans Weismann, Stuttgart-Feuerbach, Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 23, 1969, Ser. No. 868,693
Claims priority, application Germany, Oct. 25, 1968, G 68 03 835.7; June 6, 1969, G 69 22 684.2
Int. Cl. E05b *17/18*
U.S. Cl. 70—455 **11 Claims**



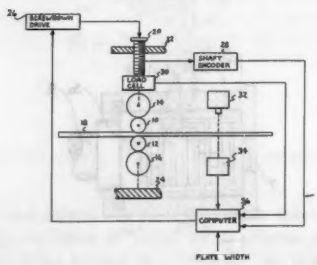
An ignition lock for automotive vehicles has a housing provided in one surface with an inwardly extending recess. A key-operated lock cylinder is received in the recess and turnable therein between at least two positions in which it respectively makes and brakes an electrical circuit. The cylinder defines with the housing an annular gap adjacent the surface of the housing and has an exposed face located exteriorly of the recess and formed with a keyhole. Cover means covers the gap and the keyhole against the entry of contaminants while permitting insertion of the key into and withdrawal of the key from the key hole.

3,625,036

GAGE CONTROL METHOD INCLUDING CONSIDERATION OF PLATE WIDTH EFFECT ON ROLL OPENING

Donald J. Fapiano, Scotia, N.Y., assignor to General Electric Company

Filed Apr. 28, 1969, Ser. No. 819,723
Int. Cl. B21b *37/00*
U.S. Cl. 72—6 **6 Claims**



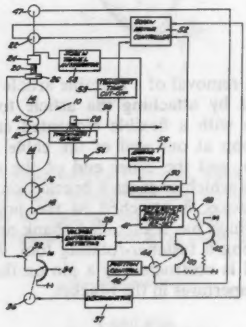
A plate mill gage control method is described wherein the roll opening at the mill center line (as determined in conventional fashion from the desired delivery gage, the predicted mill stretch and any changes in the center line diameter of the mill rolls from the last mill calibration) is modified by an amount substantially equal to the total space existing between adjacent roll surfaces in an unloaded condition at a point corresponding to the edge of the plate to be rolled. This modified roll opening then is employed to position the rolls for reduction of plate gage.

3,625,037

AUTOMATIC GAUGE CONTROL SYSTEM FOR A ROLLING MILL

Mathias Michel, Riverside, Calif., assignor to Hunter Engineering Company, Inc.

Filed Feb. 25, 1969, Ser. No. 801,974
Int. Cl. B21b *37/08*
U.S. Cl. 72—8 **6 Claims**



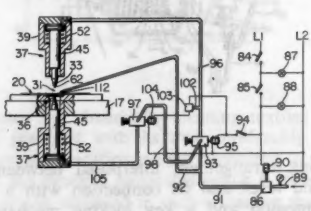
A system for automatically adjusting the opening between work rolls of a rolling mill to compensate for changes in incoming gauge. Corrective action is initiated by change in the roll separating force, as measured by a load cell, and is accomplished by a series of sequential servo mechanism operations which control the roll screws, and in which the total change in roll force is matched in a sensitive comparator against a reference signal that is modified as a function of screw travel, so that at the end of the gauge-correcting cycle, the potential change of the screw-operated reference potential is equal to the potential change of the load cell under the new force.

3,625,038

APPARATUS FOR PROVIDING ACCESSIBLE TAB MEANS IN A SHEET-LIKE CONSTRUCTION

George L. Swigert, Maineville, Ohio, assignor to Avco Corporation, Cincinnati, Ohio

Filed Dec. 10, 1969, Ser. No. 883,821
Int. Cl. B21d *28/10, 31/02, 37/00*
U.S. Cl. 72—20 **6 Claims**



An apparatus is provided which has a die and a cooperating punch which are controlled with optimum efficiency to expose tabs provided as an integral part of a

metallic layer comprising an associated laminate and bend such tabs transverse their original positions for easy access thereto. During the bending action the punch also cleans that surface of each tab which was previously bonded to a portion of a substrate which comprises the laminate and adjoins the metallic layer.

3,625,039

CORROSION RESISTANCE OF DECORATIVE CHROMIUM ELECTROPLATED OBJECTS

Theo G. Kubach, Drosselweg 68, Leonberg-Silberberg, Germany; and Werner H. R. Pritsch, Thomastrasse 57; and Wilfried Bolay, Saumweg 29, both of Stuttgart, Germany

No Drawing. Filed Aug. 28, 1969, Ser. No. 853,977
Int. Cl. C21d *7/06*
U.S. Cl. 72—53 **9 Claims**

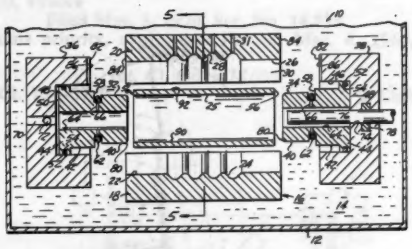
Improved corrosion resistance results in decorative chromium plated objects having chromium plated over nickel by treatment of the surface chromium layer by impingement of solid particulate matter so as to form micropores in said chromium layer. These micropores extend through said chromium layer to the underlying nickel layer. The number of micropores per square inch should exceed 3,000 and preferably be in the range of 40,000–200,000 per square inch for decorative chromium plated objects depending on the type of particle, size of particle, density of particle and momentum at impingement. Likewise, multiple nickel coatings can be used and other underlying metal layers such as copper can be interposed between the substrate and the nickel and chromium surface layers.

3,625,040

METHOD AND APPARATUS FOR FORMING ARTICLES FROM A TUBULAR BLANK

William J. De Gain, Warren, Mich., assignor to Koppy Tool Corporation, Ferndale, Mich.

Filed Aug. 6, 1969, Ser. No. 847,837
Int. Cl. B21d *26/04*
U.S. Cl. 72—59 **5 Claims**



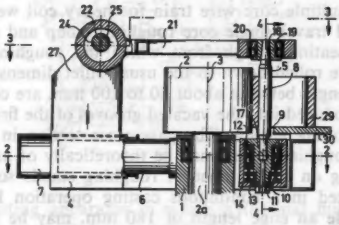
A hydrostatic method and apparatus for forming a tubular blank into irregular shapes and configurations through the application of outwardly directed pressure forces applied against the interior walls of the tubular blank. The apparatus is provided with a forming die which closes to provide a longitudinal passage for receiving and forming the tubular blank. A pair of plugs inserted within opposite ends of the tubular blank are provided with peripheral surfaces adapted to form fluid sealing engagement between the plugs and the associated interior walls of the tubular blank. In the preferred embodiment the peripheral surface of each plug has an elastomeric material disposed therein adapted to form and maintain fluid sealing engagement in response to the pressure applied within the tubular blank. Pistons associated with each plug are responsive to the pressure within the tubular blank for urging the plugs inwardly into the die passage to prevent separation of the seal from the blank as same is shortened during the shaping process.

3,625,041

ROLLING MILL FOR PRODUCING ANNULAR SHAPES

Joseph Jeuken, Holzwickede, Germany, assignor to Rheinstahl Wagner Werkzeugmaschinenfabrik m.b.H., Dortmund, Germany

Filed Aug. 19, 1969, Ser. No. 851,274
Claims priority, application Germany, Oct. 2, 1968, P 18 00 569.1
Int. Cl. B21b *1/10*
U.S. Cl. 72—101 **6 Claims**



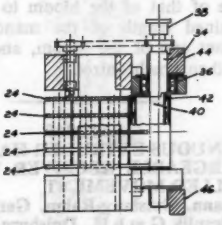
A rolling mill for producing annular shapes includes a roller rotatably mounted in the rolling mill frame and a rolling mandrel associated with the roller which is rotatably mounted at each end. The mandrel can be fed toward and away from the roller and it includes one bearing which may be connected to or removed from the rolling mandrel to facilitate the loading and unloading of the workpiece. Both of the rolling mandrel bearings are pivotal in a plane defined by the center lines of the roller and the rolling mandrel and at least one of the rolling mandrel bearings is adjustable in respect to its spacing away from the roller and independently of the feeding motion of the rolling mandrel in respect to the roller.

3,625,042

ROCKER MILL FOR ROLLING FLAT ARTICLES

Tadeusz Sendzimir, % T. Sendzimir, Inc., Waterbury, Conn. 06712

Filed Apr. 4, 1969, Ser. No. 813,544
Int. Cl. B21b *13/14, 13/20*
U.S. Cl. 72—189 **20 Claims**



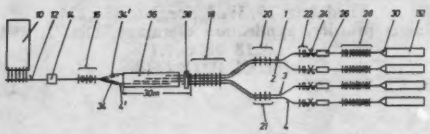
An oscillating rolling mechanism for use in a reciprocating strip mill rolling flat articles of great width and capable of resisting direct roll pressure while transmitting all bending moments to the mill housing.

3,625,043

CONTINUOUS MULTIPLE CORE ROLLING MILL TRAIN FOR PRODUCING ROLLED BAR STOCK, ESPECIALLY WIRE OF HEAVY COIL WEIGHTS

Karl Josef Neumann and Klaus Neumann, St. Ingbert (Saar), Germany, assignors to Moeller & Neumann G.m.b.H., St. Ingebert (Saar), Germany

Filed Nov. 13, 1969, Ser. No. 876,272
Claims priority, application Germany, Nov. 14, 1968, P 18 08 822.7
Int. Cl. B21b *1/18, 27/06, 41/00*
U.S. Cl. 72—202 6 Claims



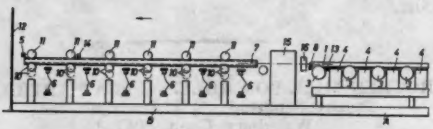
A multiple core wire train for heavy coil weights with a rapid travel single core roughing group and a multiple core heating trough from which the roughing sections that are rolled down to the usual billet dimensions of an edge length between about 80 to 100 mm. are continuously introduced into the vacated grooves of the first multiple core rolling groups. The pass cross section in the single core roughing group may be theoretically of any size depending on the number of roughing stands so that bars produced in a continuous casting operation having for example an edge length of 180 mm. may be rolled into wire in a single pass.

3,625,044

METHOD AND MEANS FOR INTRODUCING A MANDREL INTO A TUBULAR BLOOM

Manfred Bellmann, Ratingen-Tiefenbroich, and Erhard Hentzschel, Aachen, Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Sept. 4, 1969, Ser. No. 855,168
Claims priority, application Germany, Sept. 6, 1968, P 17 77 104.9
Int. Cl. B21b *17/10*
U.S. Cl. 72—209 9 Claims



A mandrel is introduced into a tubular bloom for subsequent rolling. The bloom lies in front of the rolling mill and is first moved slowly toward it, and the mandrel is pushed into and through the bloom at a velocity which is a multiple of that of the bloom to a point such that a predetermined length of the mandrel will protrude from the front end of the bloom, and the velocities of the two are then synchronized.

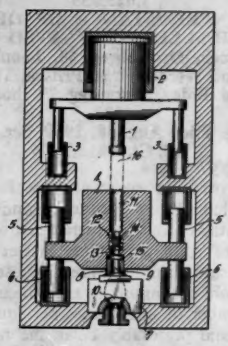
3,625,045

CONTINUOUS EXTRUDER HAVING A RECHARGEABLE RECEIVER WITH CONTROLLED MOVEMENT

Heinz Riemann, Duisburg-Rahm, Germany, assignor to Hydraulik G.m.b.H., Duisburg, Germany

Filed July 9, 1969, Ser. No. 840,170
Int. Cl. B21c *33/00*
U.S. Cl. 72—270 2 Claims

A continuous extruder includes a main press die, a rechargeable receiver having a receiving chamber which can be shut off from a coaxially arranged feed line for the material to be extruded leading to a press chamber of a press head, a storage cylinder formed in the receiver, and an auxiliary apertured press die displaceably guided in the cylinder and connected to the press head. The storage cylinder is rechargeable by movement of the receiver relative to the press head, and takes over the extrusion during recharging of the shut off receiver chamber. The storage



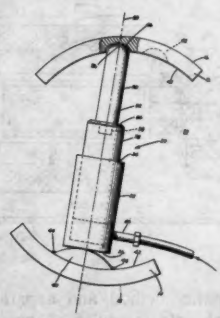
cylinder has a cross section larger than that of the receiver chamber, and the receiver is movable, under control in the extruding direction, during shutting off of the receiver chamber and with the press dies stationary, the controlled movement being independent of the designed output velocity of the extrusion. A valve is movable in the feed line to shut off the receiver chamber.

3,625,046

APPARATUS AND METHOD FOR STRAIGHTENING DEFORMED ROLLS OF SHEET STOCK

James J. Van Gompel, Fremont, Ind., assignor to Brammall, Inc., Angola, Ind.

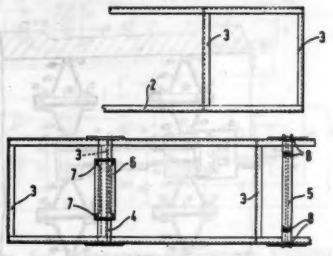
Filed Oct. 29, 1969, Ser. No. 872,093
Int. Cl. B21j *9/12*
U.S. Cl. 72—392 21 Claims



A pair of spaced-apart, outwardly curved shoes are provided for respectively engaging generally opposite internal surface areas of the core of a deformed roll. A hydraulic ram is provided extending on an axis between the shoes and having a cylinder and an extensible piston rod which terminates in a pin coaxial with the axis and having a rounded distal end. One of the shoes has a raised, part-cylindrical portion thereon having rolling engagement with the end of the cylinder remote from the piston rod, and the other shoe has an opening therein which removably receives the rounded distal end of the piston rod

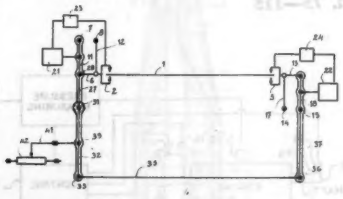
thereby providing for pivotal motion of both shoes with respect to the axis, whereby the shoes generally conform to an out-of-round configuration of the core without exerting side loading on the ram when the piston rod thereof is extended.

3,625,047
CAR BENCH
Alipio Lunardini, Via dell'Acqua 2, Massa Carrara, Italy
Filed May 27, 1968, Ser. No. 732,225
Int. Cl. B21j *13/08*
U.S. Cl. 72—459 **4 Claims**



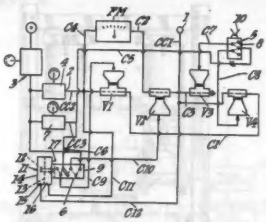
A car bench for straightening indentations in car bodies and substantially comprising a robust frame formed of a pair of longitudinal beams and a pair of adjustable transverse beams each provided with means for clamping the suspension members and mechanical members not elastically pivotally connected to the car body. An auxiliary fixture composed of at least one vertical beam carrying at least one thrust member may be associated with the frame to exert pulling and pushing stress to the car body, the frame itself serving as abutment for the thrust member and the pushing or pulling stress exerted thereby.

3,625,048
DEVICE FOR RECORDING WIDTH VARIATIONS OF A FABRIC
Jean Claude Roitel, Paris, France, assignor to Centre d'Etudes Techniques des Industries de l'Habillement, Paris, France
Filed Mar. 3, 1970, Ser. No. 16,075
Claims priority, application France, Mar. 4, 1969, 6905869
Int. Cl. G01b *13/04*
U.S. Cl. 73—37.7 **2 Claims**



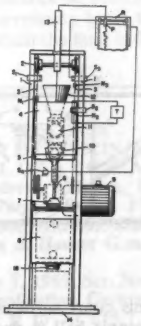
A device used for recording the width of a fabric which is unrolling, by measuring the algebraic difference of the instantaneous lateral shifts of the two selvedges of the fabric. The device consists of a combination of the following part: a proximity detector of each of the two edges of the fabric, movable in a direction transverse to that of the unrolling of the fabric; a device for driving the shifts of each of the two detectors in response to the signals emitted by this latter so as to monitor the position of the said detector continually in response to the instantaneous position of the corresponding edge of the fabric; a device for measuring the instantaneous position of each of the two detectors; a system adapted to effect the algebraic difference of the instantaneous shifts of the two detectors; and means for recording the said difference.

3,625,049
APPARATUS FOR TESTING THE FLUID TIGHTNESS OF CONTAINERS
Albert Edwin Mills, Letchworth, and Peter Gordon Davey, Oxford, England, assignors to Cosmopolitan Assurance Company Limited, Nassau, Bahamas
Continuation of application Ser. No. 722,828, Apr. 22, 1968. This application June 16, 1970, Ser. No. 48,900
Int. Cl. G01m *3/26*
U.S. Cl. 73—49.2 **17 Claims**



Leak testing apparatus in which a thermal fluid flow detector is connected in a conduit between, on the one hand a compressed-air source and, on the other hand, a container to be tested. A by-pass conduit is connected across the flow detector and a valve is provided in the by-pass conduit whereby the by-pass conduit can be opened and closed. With the valve open the container can readily be brought to a test pressure and thereafter with the valve closed flow or fluid between the compressed-air source and the container is detected by the thermal fluid flow detector.

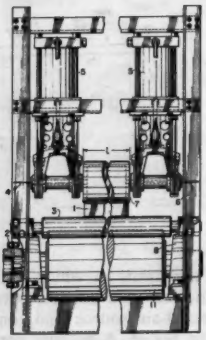
3,625,050
EQUIPMENT FOR DETERMINING THE MELT VISCOSITY OF THERMOPLASTICS
Wolfram Noetzel and Theodor Daur, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany
Filed July 18, 1969, Ser. No. 843,140
Claims priority, application Germany, July 20, 1968, P 17 73 874.8
Int. Cl. G01n *11/06*
U.S. Cl. 73—56 **4 Claims**



Equipment for determining the melt viscosity of thermoplastics consisting of a cylindrical tube with an orifice

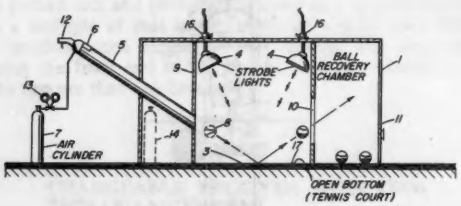
provided at the lower end, and a weighted plunger which is introduced into the tube after the plastics material to be tested has been charged into the same.

3,625,051
METHOD FOR CONTINUOUS SUPERSONIC INSPECTION OF HOT STEEL PLATES
Sutekiyo Uozumi, Tokyo, Japan, assignor to Electronics Research Co. Ltd., Kanagawa, Japan
Filed Sept. 25, 1969, Ser. No. 870,374
Claims priority, application Japan, Oct. 1, 1968, 43/70,789
Int. Cl. G01n *29/00*
U.S. Cl. 73—71.5 5 Claims



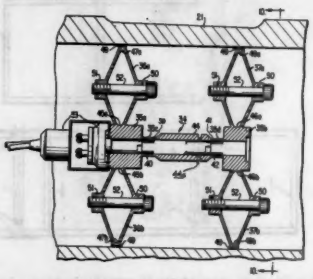
In detecting flaws in steel plates at a relative high temperature by ultrasonic signals, a steel material of the same quality as a steel plate to be tested is employed as an acoustic coupling, the steel material is formed into a cylindrical roller in order to perform continuous and automatic inspection, and a high pressure within the non-destructive range is applied to the steel material to realize an excellent acoustic coupling. Then the steel material is heated to prevent generation of an abrupt heat transfer impact.

3,625,052
TENNIS COURT SURFACE TESTER
Robert F. Jones, Little Falls, N.J., assignor to J. P. Stevens & Co., Inc., New York, N.Y.
Filed Apr. 1, 1970, Ser. No. 24,774
Int. Cl. G01n *3/52, 3/08*
U.S. Cl. 73—79 2 Claims



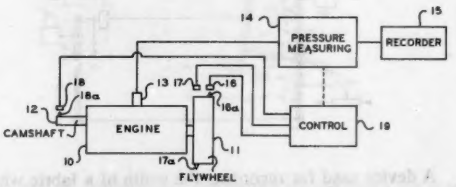
A tester for tennis court surfaces, such as textile surfaces, in which a tennis ball is fired by compressed air through a tube into a chamber that is painted flat black on the inside. The tennis ball strikes the surface to be tested in front of a camera. Two flashing strobe lights are provided so that the camera takes a series of multiple exposures of the tennis ball. The angle of the exposures of the tennis ball on the way down and on the rebound can be measured in photographs and is a measure of the surface to be tested.

3,625,053
ON-BOARD AIRCRAFT TRANSDUCER
Eric Laimins, Belmont, Mass., assignor to BLH Electronics, Inc., Waltham, Mass.
Filed Jan. 14, 1970, Ser. No. 2,892
Int. Cl. G01l *7/16, 5/12*
U.S. Cl. 73—88.5 19 Claims



Weight supported by a wheeled vehicle such as an aircraft is detected inside hollow axles by strain-gage transducers which are locked in place by individually adjustable spring-type collets making substantially line-contact connections with interior axle surfaces; the collets for each transducer are carried by rigid end portions of a sensing section including at least one deformable tubular portion equipped internally with strain gages arranged to characterize shear effects caused by the weight; and, in appropriate cases where installed within axles having non-uniform thickness, the sensing section is of an asymmetrical construction introducing self-compensation for measurement errors induced by axle non-uniformity.

3,625,054
ENGINE ANALYZER TO MEASURE MEAN EFFECTIVE PRESSURE OF A FOUR CYCLE INTERNAL COMBUSTION ENGINE
Daniel M. Vesper and Charles E. Jones, Bartlesville, Okla., assignors to Phillips Petroleum Company
Filed Nov. 20, 1969, Ser. No. 878,382
Int. Cl. G01m *15/00*
U.S. Cl. 73—115 5 Claims



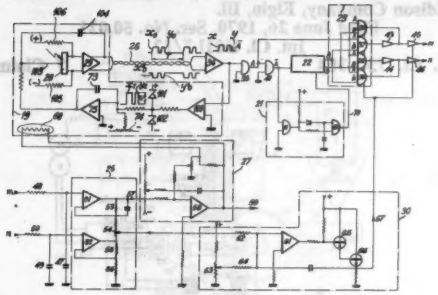
The indicated mean effective pressure in the cylinder of an internal combustion engine is measured from the output of a pressure transducer. This is accomplished by establishing a signal representative of the difference between the integrals of the cylinder pressure during compression and expansion. The measuring apparatus includes an integrator and switching means to transmit pressure signals in response to operation of the engine.

3,625,055

SYSTEM FOR MEASURING THE TORQUE TRANSMITTED BY A ROTATING SHAFT

Pierre Lucien Roger Lafourcade, Saint-Victoret, France, assignor to Sud-Aviation, Societe National de Constructions Aeronautiques, Paris, France

Filed Dec. 4, 1969, Ser. No. 882,232
Claims priority, application France, Dec. 9, 1968, 177,223; Nov. 21, 1969, 40,112
Int. Cl. C01l *3/08*
U.S. Cl. 73—136 A 13 Claims



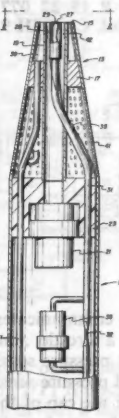
A system for measuring the torque transmitted by a rotating shaft comprises two connected coaxial rotating shafts. One of the shafts transmits the torque which is to be measured. One of the two shafts is rigidly connected to a disc which is formed, towards its periphery, with a rectangular aperture extending tangentially in relation to the axis of the shafts, while the other shaft is rigidly connected to a radial index extending through the said aperture, a fixed light source providing an axial beam of light which, on each revolution of the shafts, illuminates a fixed opto-electronic pick-up through the said aperture, the two electronic signals corresponding to the two successive aperture portions separated by the index being delivered to a comparison system for measuring the relative offset of the two shafts.

3,625,056

ENTHALPY AND PRESSURE SENSOR

Andrew Wortman, Santa Monica, Calif., assignor to Northrop Corporation, Beverly Hills, Calif.

Filed July 7, 1969, Ser. No. 839,330
Int. Cl. G01k *17/00*
U.S. Cl. 73—190 R 10 Claims



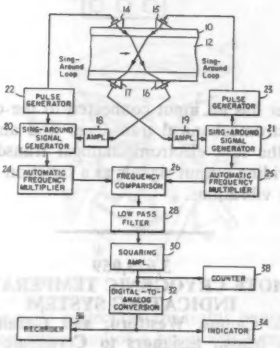
A sensor for measuring the recovery pressure and enthalpy of very high energy flows, which comprises a temperature sensor disposed in the nose of the device with means for additionally determining the pressure in the temperature sensing region. Further, means is provided for transpiration cooling the temperature sensing element together with secondary means for transpiration cooling the entire skin of the sensing device.

3,625,057

ULTRASONIC FLOWMETER

Yuji Yoshiyama, Takayoshi Ezawa, and Kazuhiro Akuta, Amagasaki, Hyogo, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1968, Ser. No. 771,394
Claims priority, application Japan, Nov. 1, 1967, 42/70,379
Int. Cl. G01p *5/00*
U.S. Cl. 73—194 A 3 Claims



Signals from each of two sing-around loops, each including a pair of ultrasonic transducer-transmitters and transducer-receivers, are frequency multiplied by a predetermined number by an automatic frequency multiplier irrespective of a variation in their pulse recurrence period. Then the signals from the multipliers are applied to a frequency comparison circuit to develop a difference frequency-signal between the multiplied frequencies resulting from both loops. This difference signal is converted to an analog quantity representing a measure of a velocity of flow of the associated fluid. A time delay circuit can be connected in each sing-around loop to impart to the frequency difference signal a predetermined value or to electrically adjust a distance between both elements. Means are provided for determining from the frequency difference a direction in which the fluid is flowing.

3,625,058

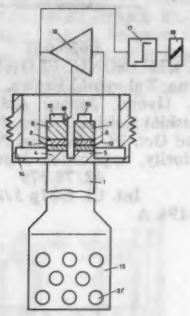
APPARATUS FOR DETERMINING THE FILLING LEVEL OF A CONTAINER

George Herbert Endress, Reinach, Basel-Land, Switzerland, and Hans-Jürgen Franz, Fahrnau Baden, and Eberhard Hermann, Eichsel Baden, Germany, assignors to Endress & Hauser G.m.b.H. & Co., Baden, Germany

Filed July 7, 1969, Ser. No. 839,320
Claims priority, application Germany, July 10, 1968, P 17 73 815.7
Int. Cl. G01f *23/00*; G05d *11/13*
U.S. Cl. 73—290 V 11 Claims

Apparatus for determining the filling level of a container includes two vibrator elements extending into the

container. A first electromechanical transducer excites the elements into parallel vibrations of respective opposing senses, and a second electromechanical transducer transforms the vibrations into electrical signals having amplitudes corresponding to the amplitudes of the vibrations.

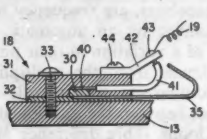


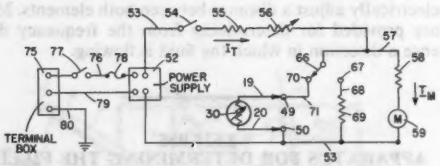
An amplifier has an input connected to the output of the second electromechanical transducer and an output connected to the first electromechanical transducer and to means providing output signals as a function of the amplitude of the vibrations.

3,625,059
REMOTE CRYOGENIC TEMPERATURE INDICATING SYSTEM

Armand L. Camus, Westford, and Gerald J. Fortier, Danvers, Mass., assignors to Cryogenic Technology, Inc., Waltham, Mass.

Filed Aug. 8, 1968, Ser. No. 751,214
Int. Cl. G01k *1/02, 1/14, 7/22*
U.S. Cl. 73—343.5 **1 Claim**



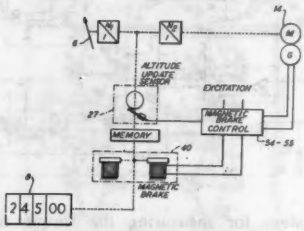


A device for accurately observing and recording cryogenic temperatures remote from the actual cryogenic equipment. A thermistor is mounted on the refrigerator at the point where the temperature is to be determined, and lead wires from the thermistor are connected to a circuit which includes a meter and its associated circuit, a standardization resistant circuit in parallel with the meter circuit, and a switch adapted to selectively connect either the standardization resistant circuit or the thermistor circuit. The combination of thermistor, mounting, and circuit eliminates varations in temperatures measurement which may be brought about by self-heating within the thermistor due to large power dissipation within the circuit.

3,625,060
INDICATOR SYSTEMS WITH POINTER AND COUNTER

John D. McCallion, Pompano Beach, and Henry J. Carlomagno, Plantation, Fla., assignors to McGraw-Edison Company, Elgin, Ill.

Filed June 26, 1970, Ser. No. 50,021
Int. Cl. G01l *7/12*
U.S. Cl. 73—384 **7 Claims**

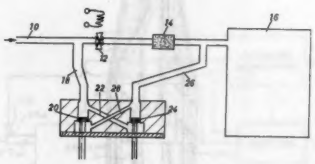


The altitude indicator has a counter for registering altitude in steps of twenty foot increments and a pointer progressively movable with change in altitude for measuring each increment. The invention includes a sensor movable in proportion to the movement of the pointer to release a brake on the counter when the pointer goes through a predetermined incremental movement to cause the counter to be shifted in a backward or forward direction by one increment depending on whether the altitude is decreasing or increasing.

3,625,061
BAROMETRIC ALTITUDE SIGNAL TRANSMITTER FOR PILOTS

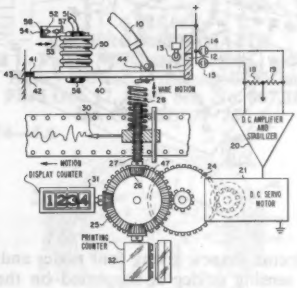
Karlhans Schwarz, Owingen, Germany, assignor to Bodenseewerk Geratetechnik GmbH, Uberlingen (Bodensee), Germany

Filed Apr. 27, 1970, Ser. No. 32,067
Claims priority, application Germany, Apr. 30, 1969, P 19 22 077.0
Int. Cl. G01l *9/00*
U.S. Cl. 73—384 **9 Claims**



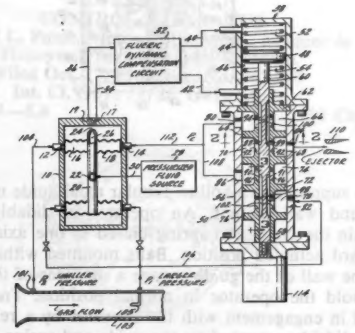
Ambient pressure communicates with a closed chamber through a valve and a throttle. Ambient pressure is applied to the cap of a first pressure sensitive transistor and with the base of a second pressure sensitive transistor while the base of the first and the cap of the second have reference pressures applied thereto from the chamber. The two transistors are connected in two legs of a bridge circuit. A constant current is applied to one diagonal of the bridge and an output signal is obtained from the other diagonal.

3,625,062
PRESSURE INDICATING APPARATUS
William A. Heske, 2101 Burr St., Fairfield, Conn. 06430
Continuation-in-part of application Ser. No. 859,246, Sept. 17, 1969, which is a continuation-in-part of application Ser. No. 732,472, Apr. 12, 1968, which in turn is a continuation-in-part of application Ser. No. 565,857, July 18, 1966. This application Aug. 24, 1970, Ser. No. 66,366
Int. Cl. G011 *9/00*
U.S. Cl. 73—398 R **11 Claims**



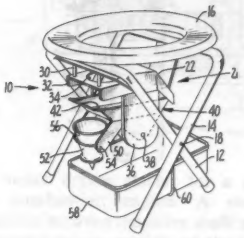
Apparatus for effecting absolute or differential pressure sensitivity of a pressure measuring device. A bellows atmospherically balanced against a system pressure unit, such as a Bourdon tube or second bellows, is either evacuated for absolute pressure sensitivity or connected to a pressure source for differential pressure sensitivity.

3,625,063
PRESSURE RATIO TRANSDUCER
Thomas F. Urbanosky, Cincinnati, Ohio, assignor to General Electric Company
Filed Mar. 6, 1970, Ser. No. 17,188
Int. Cl. G011 *13/02*
U.S. Cl. 73—407 PR **7 Claims**



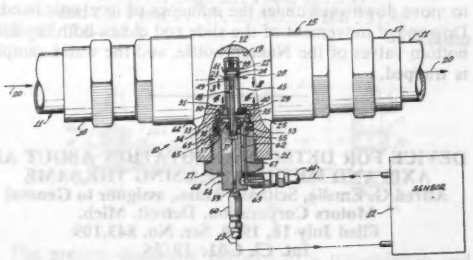
A pressure ratio sensor or transducer for generating an output proportional to P_2/P_1 is disclosed which comprises a fluid signal summing device, a flueric dynamic compensation circuit, a mechanical valve, and a feedback loop. P_2 provides an input to the summing device, while P_1 provides an input to the mechanical valve. The mechanical valve is basically a spool valve with three lands and an integral piston of larger diameter. The output of the fluerics is a differential pressure which is applied across the piston area to drive the spool. As the spool moves, each of the three lands crosses over a shaped port varying the exposed area in some prescribed fashion. Two of these areas are used to form an area ratio which is a unique function of the pressure ratio of concern. The third generates an output signal which is a function of the shaft position, which, in turn, yields an output indicative of the sensed pressure ratio.

3,625,064
AUTOMATIC MIDSTREAM URINE SAMPLE COLLECTOR
Frank Hinman, Jr., and Arthur Lutz, San Francisco, Calif., assignors to the United States of America as represented by the Secretary of the Army
Filed Jan. 9, 1969, Ser. No. 790,028
Int. Cl. G01n *1/10*
U.S. Cl. 73—421 R **6 Claims**



A urine sample collection apparatus having collection receptacles on either end of a beam which moves responsive to collected portions of the incoming stream to collect a specimen of a predetermined portion of an incoming urine stream.

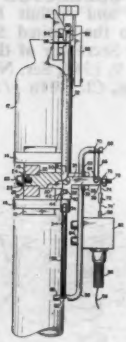
3,625,065
FLUID SAMPLING DEVICE
Lloyd W. Thompson, Buena Park, Calif., assignor to Thompson Industries, Buena Park, Calif.
Filed Apr. 6, 1970, Ser. No. 25,940
Int. Cl. G01n *1/10*
U.S. Cl. 73—422 **10 Claims**



A device having a ported probe projecting into a fluid conduit to withdraw fluid from the center thereof, a valve plunger movable in the probe between open and closed positions and normally held in the closed position, and a detachably mountable sampling fitting operable during coupling to the device to shift the plunger to the open

position while simultaneously connecting the inlet and return ports of the probe through the plunger to the inlet and return lines of a particle counter.

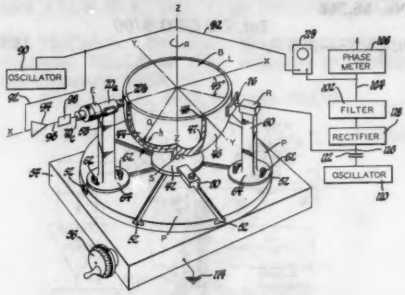
3,625,066
WATER SAMPLING APPARATUS
Michael L. Greene, Hillcrest Heights, Md., assignor to the United States of America as represented by the Secretary of the Navy
Filed Mar. 30, 1970, Ser. No. 23,641
Int. Cl. G01n *1/10*
U.S. Cl. 73—425.4 R **5 Claims**



Water sampling apparatus includes a standard Nansen bottle to which is clamped a mounting block which swivelingly supports a support bar, transversely bored to guide a slide rod. A slide rod, slidably disposed in the bore of the support bar, is attached to the upper valve lever of the Nansen bottle. A connecting rod conventionally connects the upper and lower valve levers so that the valves close together. The slide rod is urged downward by several elastic bands, but is prevented from downward movement by a pivoted latch which engages a pin projecting from the slide rod. The latch is, in turn, urged to unlatching position by its own elastic bands, but is restrained in latching position by a low wattage resistor. When the apparatus has been lowered to the proper depth in the sea, a high voltage can be delivered to the resistor through appropriate circuitry to break the resistor and permit the latch to move under the influence of its elastic bands out of latching position and release the slide rod to move downward under the influence of its elastic bands. Downward movement of the slide rod closes both top and bottom valves of the Nansen bottle, and the water sample is trapped.

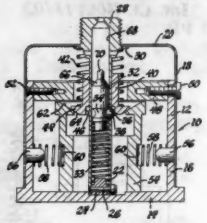
3,625,067
DEVICE FOR DETECTING ROTATION ABOUT AN AXIS AND METHOD OF USING THE SAME
Alfred G. Emslie, Scituate, Mass., assignor to General Motors Corporation, Detroit, Mich.
Filed July 18, 1969, Ser. No. 843,109
Int. Cl. G01c *19/56*
U.S. Cl. 73—505 **15 Claims**

A device for detecting rotation wherein radial vibrations are established in a ring-like body capable of high-Q vibration and of frequency such as to produce a standing wave pattern having spaced nodes and anti-nodes. The radial vibration amplitude at a nodal region is sensed to measure the rotation of the body. In preferred form, the body is cup-like in shape, supported on a platform by an axially positioned stem, and defines a ring-like lip capable of high-Q vibrations. Exercising vibrations in the radial mode are imparted to the lip of the device by an exerciser also mounted on the platform, and are of frequency to produce vibrations between two generally



elliptical extreme shapes, giving four nodes and four anti-nodes. The sensing device is supported on the platform and is located at one of the nodes. In its preferred form, the body is made of high-Q factor aluminum alloy; its lip is about 0.025 inch thick and its diameter at the lip is about 2 inches. The frequency of the exercising vibrations is about 1600 cycles per second.

3,625,068
OMNIDIRECTIONAL SENSOR
Robert Garth Kelly, Franklin, Wis., assignor to General Motors Corporation, Detroit, Mich.
Filed Aug. 31, 1970, Ser. No. 68,390
Int. Cl. G01p *15/02*
U.S. Cl. 73—514 **3 Claims**



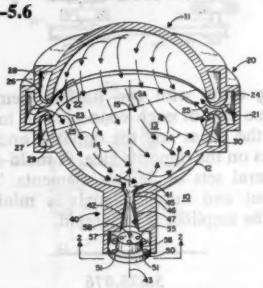
A support has a hollow tubular axial guide mounted on an end wall thereof. An operator is slidably mounted within the guide and spring biased in one axial direction toward actuated position. Balls mounted within openings in the wall of the guide engage a shoulder of the operator to hold the operator in normal position. The balls are held in engagement with the operator by a release member slidably mounted on the guide and spring biased in a direction opposite the direction of movement of the operator. An annular seismic mass surrounds the guide and includes an upper conical surface engageable by a like mating surface of the release member to thereby locate the seismic mass radially with respect to the guide. Additional centering springs between the mass and a cylindrical side wall of the support cooperate with the bias on the release member to additionally locate the mass. When

the mass receives an acceleration pulse of predetermined amplitude and time, it will move radially of the guide, and the camming action of the mating surfaces on the mass and release member move the release member axially relative to the guide to release the balls and permit movement of the operator to actuated position.

ERRATUM

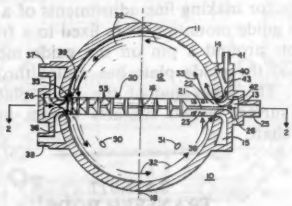
For Class 73—457 see:
Patent No. 3,625,081

3,625,069
CONTROL APPARATUS
David L. Paine, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 17, 1969, Ser. No. 867,286
Int. Cl. G01c *19/28*
U.S. Cl. 74—5.6 **10 Claims**



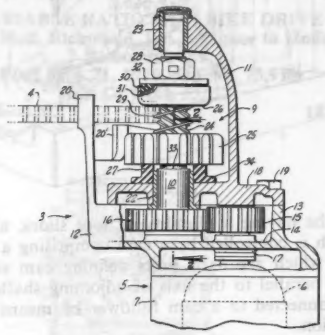
A flow direction sensor comprising a surface across which fluid is adapted to flow. A converging-diverging passage extending along an axis perpendicular to the surface connects a circular sensing port in the surface to a fluid sink whereby fluid is drawn through the passage. The passage converges with distance from the sensing port to an area of minimum diameter and then diverges at such an angle that fluid attaches to only a portion of the passage wall depending upon the direction of flow across the surface. A plurality of pressure ports are associated with the diverging portion of the passage for sensing the location of flow attached to the wall thereof.

3,625,070
CONTROL APPARATUS
David L. Paine, Minneapolis, Minn., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Oct. 17, 1969, Ser. No. 867,269
Int. Cl. G01c *19/28;* **G01p** *15/14*
U.S. Cl. 74—5.6 **10 Claims**



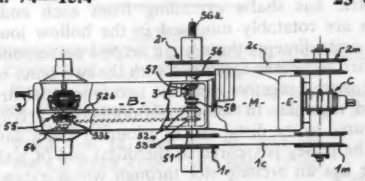
A single axis flueric attitude gyroscope having a spherical chamber adapted to contain a spinning fluid mass and circumferential nozzle means located on a great circle of the chamber for introducing fluid thereinto. The nozzle means comprises a central opening bounded by a pair of divergent opposite walls, each configured for attachment of fluid flow thereto, fluid flowing into the chamber at any point along the nozzle attaching to one of its walls depending on the direction of flow in the chamber adjacent that point, thereby sustaining rotation of the fluid mass about any spin axis lying in the plane of the great circle. Fluidic caging means and signal pickoff means is also provided.

3,625,071
ELECTRIC STARTER FOR SMALL INTERNAL COMBUSTION ENGINES
Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.
Filed Apr. 3, 1970, Ser. No. 25,473
Int. Cl. F02n *11/00*
U.S. Cl. 74—7 R **10 Claims**



An electric motor driven starter for a small vertical shaft internal combustion engine. A steeply pitched threaded connection between the drive shaft and the pinion thereon effects rapid return motion of the pinion toward its inactive position in consequence of rotation thereof in the same direction as the shaft is driven, but at a greater rate. A collar of resiliently yieldable material defines the inactive position of the pinion and cushions its return thereto. The collar encircles a bearing in which the shaft is journalled, and it is normally frictionally engaged by the retracted pinion and snugly confined between the retracted pinion and a fixed wall in which the bearing is mounted to assure against entry of dirt into the bearing.

3,625,072
TRANSMISSION AND SPEED-VARIATION DEVICE APPLICABLE TO TRACTORS FOR EXAMPLE
Emile Bobard, 17 Rue de Reon, Beaune, Cote d'Or, France
Filed Sept. 17, 1969, Ser. No. 858,606
Claims priority, application France, Sept. 20, 1968, 167,073; Sept. 27, 1968, 167,929
Int. Cl. F16d *21/06, 25/063;* **F16h** *55/56*
U.S. Cl. 74—15.4 **23 Claims**

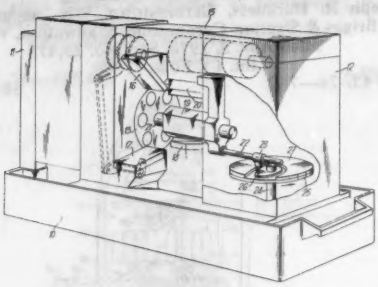


The present disclosure pertains to a transmission and speed variation device for an automotive vehicle, such as a harvester combine or tractor for driving the vehicle both in forward and reverse directions at various speeds in both directions. The device is capable of engaging at will, independently of one another, at least two driven shafts with a driving shaft and includes a speed changing means coupled to at least one of the driven shafts and means for axial clamping of conventional clutch plates.

3,625,073
AUTOMATIC LATHES

Reginald John Dixon, Solihull, and Harold James Gilbert, Coventry, England, assignors to Wickman Machine Tool Sales Limited, Coventry, England

Filed Nov. 14, 1969, Ser. No. 876,962
Int. Cl. F16h *25/08*
U.S. Cl. 74—55 3 Claims

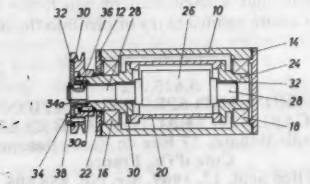


A lathe having a plurality of tool slides, at least one of which is controlled by a cam comprising a disc member on which are fixed parts defining cam surfaces extending parallel to the axis of adjoining shafts, the slide being connected to a cam follower by means of a rigid connection.

3,625,074
ECCENTRIC VIBRATOR

Hans-Georg Waschulewski and Helmut Erdmann, Dusseldorf, Germany, assignors to Losenhausen Maschinenbau Aktiengesellschaft, Dusseldorf-Grafenberg, Germany

Filed Apr. 21, 1969, Ser. No. 818,001
Claims priority, application Germany, Apr. 26, 1968, P 17 58 226.2
Int. Cl. F16h *33/00*
U.S. Cl. 74—61 7 Claims

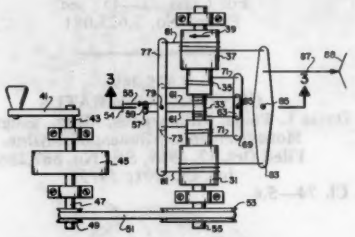


An outer eccentric has hollow journals at opposite ends thereof which are rotatably mounted in a frame. An inner eccentric has shafts extending from each end thereof which are rotatably mounted in the hollow journals. In some embodiments there are a second corresponding pair of inner and outer eccentrics with the two outer eccentrics being geared together, and the two inner eccentrics being geared together. In some embodiments a driving pulley is secured to the distal end of a journal and a flange abutting the pulley is secured to the distal end of a shaft. The flange has an arcuate slot through which extends a stud bolt threaded into the pulley thereby enabling the angular position of the inner and outer eccentrics to be adjusted relative to each other. In some embodiments the distal ends of a hollow journal and a shaft have pulleys mounted thereon. A gear driving device has two concentric pulleys, one of which is belt connected to the pulley on the journal, and the other of which is belt connected to the pulley on the shaft. One of these two pulleys of the driving device can be adjusted to different angular positions about its axis.

3,625,075
MECHANICAL AMPLIFIER

Jeremy M. Harris, Worthington, Ohio, assignor to The Battelle Development Corporation, Columbus, Ohio

Original application Feb. 13, 1967, Ser. No. 615,687, now Patent No. 3,491,603. Divided and this application Oct. 6, 1969, Ser. No. 864,107
Int. Cl. F16h *21/12*; G05b *11/00*; H04m *1/00*
U.S. Cl. 74—63 8 Claims

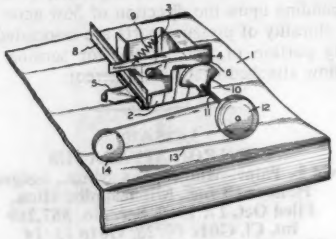


A rotating drum with two flexible elements wrapped around it, one end of each connected to input means on one side of the drum and the opposite end connected to output means on the opposite side. A multi-stage amplifier includes several sets of flexible elements. The distortion between input and output signals is minimal, and the response of the amplifier is very rapid.

3,625,076
DEVICE FOR THE FINE ADJUSTMENT OF TAPE POSITION IN A TAPE RECORDER

Takehiko Yamada, Osaka, Japan, assignor to Orion Electric Co., Ltd., Osaka, Japan

Filed Nov. 14, 1969, Ser. No. 876,916
Claims priority, application Japan, Feb. 3, 1969, 44/10,006
Int. Cl. F16h *27/02*; G11b *5/86, 5/00*
U.S. Cl. 74—89 1 Claim



A device for making fine adjustments of a tape position includes a guide mounting plate fixed to a frame. A guide plate pivots around a pin on the guide mounting plate. One end of the guide plate has a slot through which a tape runs. The other end of the guide plate has a cam engaging surface which contacts a cam mounted on a rotatable shaft.

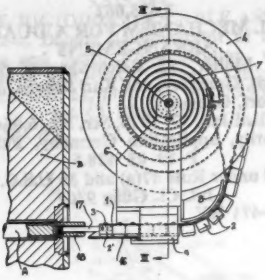
3,625,077
TRANSFER RODS

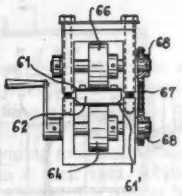
Henri Bernard, Antony, and Henri Bruel, Lyon, France, assignors to Commissariat a l'Energie Atomique and Societe Robatel-SLPI, Paris, France

Filed Aug. 18, 1969, Ser. No. 850,773
Claims priority, application France, Aug. 22, 1968, 163,779
Int. Cl. F16h *29/02*
U.S. Cl. 74—89.21 6 Claims

The transfer rod is made up of rigid blocks or plates referred to as rod elements which can be interlocked and

are secured to at least one metallic strip having high tensile strength. The rod is stored on a freely rotatable take-up drum and delivered by guiding and actuating means in opposition to a spiral spring mounted in the drum.





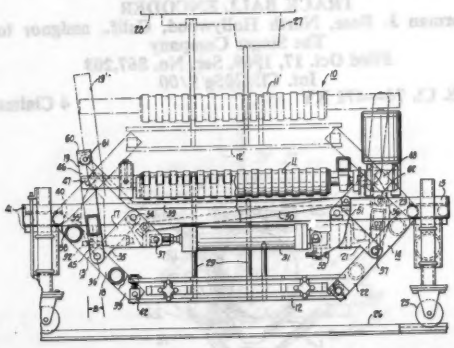
3,625,078
ELEVATING TABLE

Hugh A. Bourassa, University Heights, Arthur H. Emser, Mentor, and Edward J. Ptak, Cleveland, Ohio, assignors to Acme-Cleveland Corporation

Original application June 10, 1968, Ser. No. 735,867. Divided and this application Nov. 21, 1969, Ser. No. 871,275

Int. Cl. F16h *21/44*

U.S. Cl. 74—110 **9 Claims**



The disclosure relates to an assembly to receive a core or mold from a foundry machine and to move it gently onto a conveyor. The core may be dropped by gravity onto a series of fingers held in a core receiving table and then this table drops downwardly to gently place the core on a ribbon type conveyor. The table moves downwardly about twice as far as the conveyor to achieve this gentle transfer and to get both the conveyor and the table with its fingers out of the way of the foundry machine and its succeeding cycles of operation. Both the core receiving table and the conveyor move along a vertical path with a common motive means for the two. The foregoing abstract is merely a resume of one general application and is not a complete discussion of all principles of operation, applications or methods and is not to be construed as a limitation on the scope of the claimed subject matter.

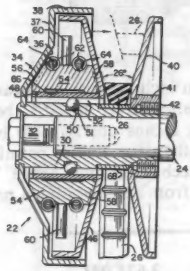
3,625,079
VARIABLE RATIO MINI BIKE DRIVE

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

Filed Sept. 21, 1970, Ser. No. 73,916

Int. Cl. F16h *55/52*

U.S. Cl. 74—230.17 **18 Claims**



A variable-ratio belt drive for mini bikes and the like, responsive to both engine speed and drive torque. A normally-open, variable-width driver pulley responsive to engine speed is connected by a V-belt to a normally-closed variable-width driven pulley which initially gives a high-reduction drive ratio, e.g., 3:1. One flange of the driven pulley is movable and urged toward the fixed flange by low-angle cams and a torsion spring. A movable flange of the driver pulley is urged toward the fixed flange thereof by wedge weights acting between the movable flange and a reaction cone, so that increased speed closes the driver pulley and exerts belt tension to open the driven pulley, which lowers the drive ratio. High torque causes the cams to close the driven pulley and overcome the speed-response control, hence to increase the drive ratio to handle the increased torque at high engine speed.

3,625,080
TRANSMISSION SYNCHRONIZING AND SHIFT CONTROL SUPERVISORY SYSTEM

Todd L. Rachel, Elmira, David S. Vaughan, Erin, and Theodore K. Riggen, Elmira, N.Y., assignors to The Bendix Corporation

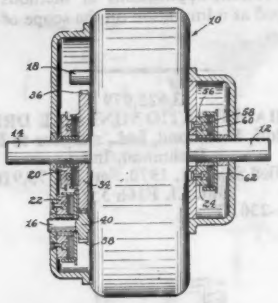
Filed Nov. 24, 1969, Ser. No. 879,483

Int. Cl. F16h *3/38, 5/42;* B60k *17/02*

U.S. Cl. 74—336 **5 Claims**

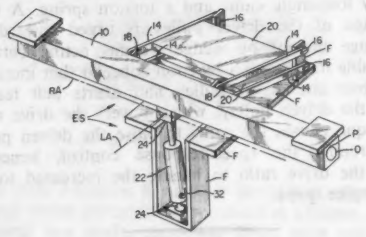
A control system for a mechanical power transmission to provide synchronization of gear speeds to thereby permit automatic gear changing in response to a desired gear selection. The system includes anticipation circuitry to provide the control system with a signal indicative of synchronization sufficiently in advance of actual synchronization to compensate for response time delays in the remainder of the system and in the shifting mechanism. Further circuitry is provided to inhibit the system if the desired gear change would not be compatible with best

operation of the associated prime mover. The shift inhibit circuitry is provided with means for recognizing the error in gear selection and with means for correcting the error by attempting to select a proper gear setting. A shift lever mechanism operative to be self-disabling in the event of a down shift to a prohibited position and further operative to seek the nearest permitted position is also shown.



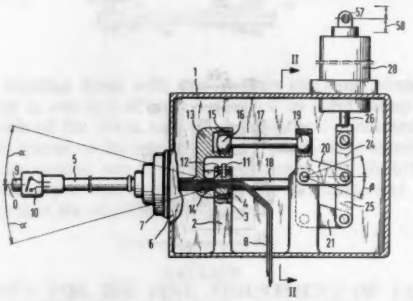
The lever mechanism includes biasing means operative to bias the gear indicating lever toward the highest gear settings and latching means operative to be energized at gear settings lower than the lowest permitted setting to prevent the lever mechanism, and hence, the associated system input means, from commanding a prohibited down shift.

3,625,081
APPARATUS FOR DETECTING UNBALANCE OF VEHICLE WHEELS
Marcellus S. Merrill, 335 Colorado Blvd., Denver, Colo. 80236
Filed Apr. 1, 1969, Ser. No. 811,727
Int. Cl. G01m *1/28*
U.S. Cl. 73—457 **14 Claims**



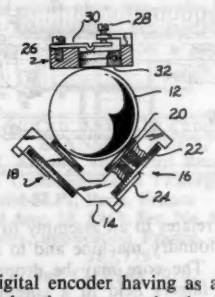
Apparatus for detecting rotary unbalance of automotive vehicle wheels in situ characterized by an improved elevating and supporting beam which may oscillate about its midpoint with equal amplitudes of oscillation of its ends, permitting a single vibration pick-up to be employed at only one end of the beam and also establishing a known phase relationship between the detected magnitude of unbalance and the actual position of unbalance. Wheel spin speed may be lower than conventional spin speed through a critical speed where resonance occurs which permits use of relatively low constant speed sparkless motors conforming to safety requirements to obviate fire and explosion hazards near floor level. The foregoing apparatus is common to two versions, one being a pit mount requiring extensive floor excavation and the other a floor mount requiring a minimum of excavation. Pairs of chocks are employed to locate companion wheels in predetermined position relative to the beam and one chock of each pair is movable to perform the additional function of arresting rotation of a wheel.

3,625,082
CONTROL MECHANISM FOR A DUAL SERVO ARRANGEMENT
Rudolf-Erich Muller, 12 Reichenbacher Strasse, 8732 Munnerstadt, Germany, and Karl Schorn, deceased, late of Dusseldorf, Germany
Filed Jan. 27, 1970, Ser. No. 6,064
Claims priority, application Germany, Feb. 4, 1969, P 19 05 428.5
(Filed under Rule 47(a) and 35 U.S.C. 116)
Int. Cl. G05g *9/04*
U.S. Cl. 74—471 XY **13 Claims**



Two hydraulic actuators of a servo mechanism are independently controlled by pivoting movements of the same control stick in two perpendicular planes. The stick is mounted on a universal joint and carries two additional universal joints on radial arms offset 90° about the stick axis and equidistant from the same, and linkages connecting the additional joints to the actuators respectively are equipped with biasing arrangements for returning the stick to the neutral position and may be equipped with magnets for holding the stick in a desired position angularly offset from the neutral position.

3,625,083
TRACK BALL ENCODER
Norman J. Bose, North Hollywood, Calif., assignor to The Singer Company
Filed Oct. 17, 1969, Ser. No. 867,209
Int. Cl. G05g *9/00*
U.S. Cl. 74—471 XY **4 Claims**



A two axis digital encoder having as an input a manually controlled bearing-supported spherical ball which, when rotated, actuates two rotatable encoders frictionally

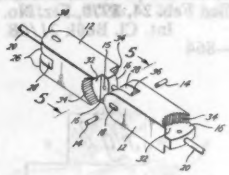
coupled to the ball surface and oriented 90 degrees from each other so that the output of one encoder represents an X function, and the other a Y function.

3,625,084

FLEXIBLE/RIGIDIFIABLE CABLE ASSEMBLY

George M. Low, Deputy Administrator of the National Aeronautics and Space Administration, with respect to an invention of Cletus J. Siebert, Littletown, Colo.

Filed Sept. 21, 1970, Ser. No. 73,932
Int. Cl. F16c *1/00*
U.S. Cl. 74—501 R 9 Claims



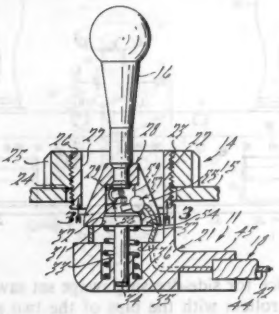
A flexible yet rigidifiable cable assembly capable of being selectively tensioned. A plurality of elongate link members each have an axial bore to receive a cable. At one end of each link member are two spaced, parallel projections providing a slot therebetween, the projections having serrations at their apex. At the second end of each link member is a projecting tongue having serrated, semi-circular reliefs on either side. In assembled relation, the parallel projections of one end of a link member are engageable with and journaled to the semi-circular reliefs on either side of the tongue of another link member. A spring between each link member permits flexibility of the cable assembly by maintaining the links in a disengaged relation, the cable assembly being rigidifiable upon overcoming the bias of the springs through tensioning of the cable whereby the links engage.

3,625,085

CONTROL FOR REMOTE CONTROLLED MIRROR

Wilford B. Shrode, Huntington Woods, Mich., assignor to Leader International Industries, Inc.

Filed Oct. 27, 1969, Ser. No. 869,802
Int. Cl. F16c *1/14*
U.S. Cl. 74—501 7 Claims



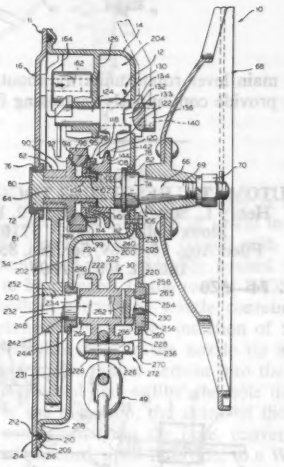
A remote controlled mirror assembly wherein motion is transmitted from a control lever to a remotely positioned mirror by means of a plurality of flexible transmitters. An arrangement is provided for conveniently attaching the ends of the transmitters to the control lever and for preventing inadvertent displacement of the wire ends by means of an interference type relationship.

3,625,086

SEALED NON-SPIN HAND BRAKE ARRANGEMENT

Eldred H. Natschke, Bourbonnais, Ill., assignor to Universal Railway Devices Company

Filed Oct. 27, 1969, Ser. No. 869,534
Int. Cl. F15d *63/00*
U.S. Cl. 74—505 6 Claims



A hand brake of the non-spin type for railroad cars including a front casing and rear attachment plate that define a housing space for the brake operating shaft, ratchet wheel, ratchet wheel clutch, brake release mechanism, and drum gear, that is sealed from the elements by a seal applied between the two. The front casing is intended to define a mounting space for the brake drum, which may be of either the single or double chain wind type and is keyed to a mounting shaft that is journaled between the casing and a brake drum cover plate that is removably secured to the casing. The drum shaft extends into the housing space where it has fixed to same the drum gear. The brake drum and shaft cooperate with bearings that journal the brake drum shaft to keep the brake drum centered in its mounting space and the drum gear spaced from the rear attachment plate.

3,625,087

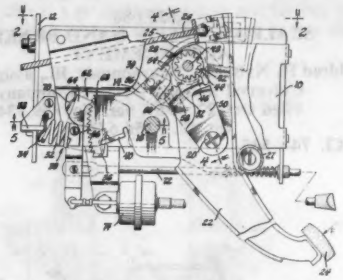
STEP RATIO PARKING BRAKE CONTROL

Donald M. Flory, Arcanum, and Elton S. Moyer, Dayton, Ohio, assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 2, 1970, Ser. No. 68,902
Int. Cl. G05g *1/04*
U.S. Cl. 74—518 3 Claims

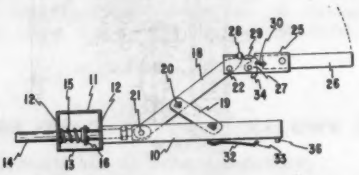
A variable ratio force multiplying parking brake control mechanism wherein a pedal lever having output means attached thereto is pivotally mounted on a main lever which is in turn pivotally mounted on a stationary bracket. A pretensioned spring holds the main lever while the pedal lever pivots thereon to provide relatively low force multiplication for fast takeup of the slack in the brake system. The reaction of the brake cable tensioning force causes the pretensioned spring to yield, and the

resulting pivotal movement of the main lever engages a clutch acting between the main lever and the pedel lever so that upon further pedal lever movement the pedal lever



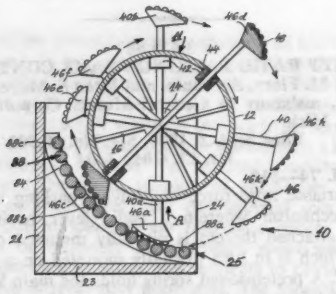
and the main lever rotate unitarily about the main lever pivot to provide continuously increasing force multiplication.

3,625,088
AUTOMATIC RESETTING TOGGLE ARM
Henry L. Sundermann, Box 79, R.R. 4, Sioux Falls, S. Dak. 57101
Filed Aug. 15, 1969, Ser. No. 850,461
Int. Cl. G05g 1/04
U.S. Cl. 74—520 **6 Claims**



A toggle or similar device having a unique operating arm. The arm includes a releasing device by which the toggle can be released. The releasing device includes a latch on one part of the handle adapted to hold the other part, and a latch release on the toggle to engage the latch and release it. The latch is adapted to re-engage so that repeated operation is possible.

3,625,089
GRAVITY WHEEL APPARATUS
Edward Rutkove, 601B Surf Ave., Brooklyn, N.Y. 11224
Filed Apr. 30, 1970, Ser. No. 33,342
Int. Cl. H02k 7/02
U.S. Cl. 74—572 **10 Claims**

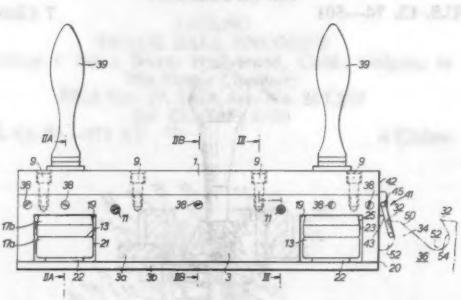


A rotary gravity wheel apparatus includes an axially horizontal cylinder carried by a support. A plurality of spokes extend diametrally of the cylinder in axially and circumferentially spaced array. Weighted shoes are mounted on opposite ends of the spokes. An inclined platform under the cylinder causes the spokes to move axially diametrally of the cylinder and raise upper shoes while lower showes ride on the platform. Roller bearings on the shoes and platform minimize friction. A governor controlled motor overcomes inertia of the cylinder when starting.

3,625,090
TRANSMISSION CONTROL
Howard E. Chana, Flint, Mich., assignor to General Motors Corporation, Detroit, Mich.
Filed Feb. 24, 1970, Ser. No. 13,718
Int. Cl. B60k 21/08
U.S. Cl. 74—864 **6 Claims**

An automatic transmission control providing for shifting between three forward drives wherein there is provided part engine throttle sequential upshifting, part engine throttle downshifting from the high to the intermediate drive, downshifting from intermediate to the low drive at a predetermined vehicle speed and coast downshifting from the high drive directly to the low drive at a predetermined vehicle speed.

3,625,091
DEVICES FOR SIDE-DRESSING SWAGE SET SAWS
Jack Wilfred Shanks, Princes Risborough, England, assignor to National Research Development Corporation, London, England
Filed Nov. 18, 1969, Ser. No. 877,750
Claims priority, application Great Britain, Nov. 20, 1968, 55,124/68
Int. Cl. B23d 63/06
U.S. Cl. 76—49 **8 Claims**



A device for side-dressing swage set saws including two pairs of rollers with the nips of the two pairs on a common plane. The rollers have surfaces for forming the swages into the required form i.e. frusto-conical surfaces for forming tapered wedges. A guide is provided for co-operation with the tops of the teeth to locate the swages relative to the frusto-conical surfaces of the rollers. The position of the guide is adjustable to allow the formation of different sets on the saw. The rollers also have cylindrical surfaces for co-operation with opposite surfaces of

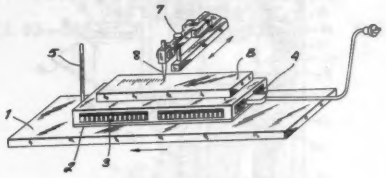
the saw beneath the swages. The distance between the rollers of a pair is adjustable whereby the device can operate upon different gauges of saws.

3,625,092

METHOD FOR MANUFACTURING DIES FOR STAMPING GRADUATED SCALES ON SLIDE RULES AND RULES FOR TECHNICAL PURPOSES

Iosif Hondrea and Mihai Hilger, Timisoara, Francisc Moser, Bucharest-sos, and Iosif Glass, Timisoara-piata, Romania, assignors to Iprofil-Tehnolemn, Timisoara, Romania

Filed Aug. 11, 1969, Ser. No. 849,041
Int. Cl. B21k *5/20*
U.S. Cl. 76—107 R **5 Claims**



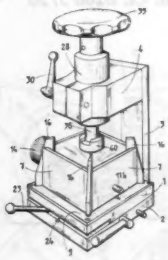
A method of embossing scales upon a thermally softenable surface of a slide rule or the like in which the die is subjected to multiple heat treatments to relax the internal stress, is precision engraved with the pattern to be embossed at the embossing temperature and is thereafter milled at ordinary temperatures with optical control of the milling operation to define a deep relief pattern equivalent to that to be formed in the rule face.

3,625,093

MACHINE FOR ROTATABLY DRIVING THE BOTTOM OF A WATCH-CASING OR THE BOTTOM OF A MEASURING APPARATUS

Bernard Freiburghaus, Bienne, Switzerland, assignor to Fimecor Fine Mecanique S.A., Bienne, Bern, Switzerland

Filed June 23, 1970, Ser. No. 49,079
Claims priority, application Switzerland, June 30, 1969, 10,046/69
Int. Cl. G04d *3/04*
U.S. Cl. 81—6 **6 Claims**



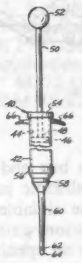
A machine for screwing or unscrewing the bottom of a watch-casing or the like having a support for receiving and holding the casing and a bracket carrying a rotatable spindle disposed above the support. The spindle is axially movable with respect to the bracket and carries a driver for application against the bottom of the casing for driving the same rotatably.

3,625,094

TIRE REPAIR CORD INSERTION TOOL

Harry F. Garrison, 7470 Gerald Ave., Warren, Mich. 48092

Original application May 12, 1969, Ser. No. 823,905. Divided and this application Dec. 15, 1969, Ser. No. 885,092
Int. Cl. B60c *25/16*
U.S. Cl. 81—15.7 **1 Claim**



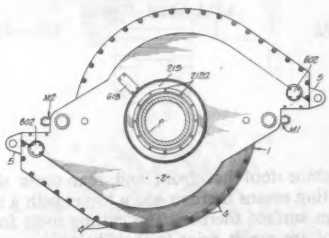
An elongated elastomeric cord is inserted in a notch, with or without a hook-shaped guard or shield in the forward end of the shank of a tool, coated with suitable elastomeric cement, and this assembly pushed into the hole in the tire to be plugged. In the tool of FIGS. 5 to 7 inclusive, the hollow barrel and nozzle contain rubber cement and a plunger which, after insertion of the elastomeric cord through a hole in the nozzle tip and then into the tire hole, injects rubber cement into the hole to coat the elastomeric cord and wall of the hole therewith. In either form of the invention, the shank of the tool or nozzle is then withdrawn from the hole, converting the V-shaped form of the cord, upon insertion, to a W-shaped form upon removal. The protruding ends of the cord are then cut off flush with the adjacent outer surface of the tire, completing the repair job.

3,625,095

DRIVE FOR PIPE TONGS

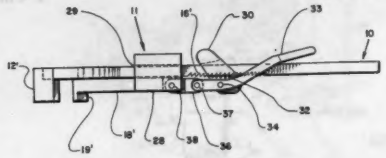
James M. Barnett, San Gabriel, John L. Dickmann, Whittier, and Melvin J. Palmer, Huntington Park, Calif., assignors to Byron Jackson Inc., Long Beach, Calif.

Filed Mar. 24, 1970, Ser. No. 22,293
Int. Cl. B25b *17/00, 23/02, 23/04*
U.S. Cl. 81—57.18 **28 Claims**



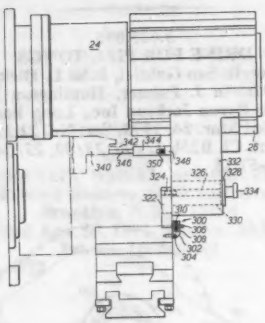
A power tong for well pipe, in which a jaw carrying ring is rotatable in opposite directions by a rotatable jaw actuating cam ring, the cam ring being gear driven by a single hydraulic motor for low torque operation, a pair of hydraulic motors driving the cam ring for higher torque operation, and a ram actuated ratchet ring being provided to move the cam ring angularly for still higher torque operation.

3,625,096
ADJUSTABLE BOX END WRENCH
Herman Myers, Lake Lynn, Pa., assignor to Insta-Snap, Inc., Monongahela, Pa.
Filed Apr. 9, 1970, Ser. No. 26,828
Int. Cl. B25b *13/14*
U.S. Cl. 81—130 **4 Claims**



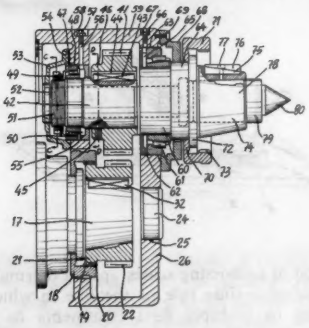
An instantly adjustable box end wrench comprising a stationary handle and a slidable jaw assembly. Both the stationary handle and the slidable jaw assembly terminating in bipartite jaw sections extending normal thereto. The stationary handle has an opening therethrough in the vicinity of its bipartite jaw section to permit a bolt to extend therethrough when a nut is being held by the jaw sections. Locking is accomplished by engaging sets of teeth along the stationary handle and slidable jaw assembly, and additional locking can be accomplished by an over-center link arrangement.

3,625,097
METHOD AND APPARATUS FOR SETTING CUTTING TOOLS IN MACHINE TOOLS
Leslie Harkness, Halifax, England, assignor to Warner Swasey Asquith Limited, Halifax, England
Filed Aug. 14, 1968, Ser. No. 752,604
Claims priority, application Great Britain, Sept. 15, 1967, 42,065/67
Int. Cl. B23b *1/00*
U.S. Cl. 82—1 C **8 Claims**



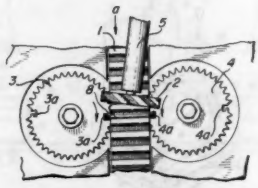
A machine tool has front and rear cross slides with tool locating means thereon and a turret with a tool locating datum surface thereon. The cutting tools for the machine tool are preset prior to their being mounted on the turret and cross slides. The tools are preset by using apparatus which includes a first jig operable to preset tools for use on both the front and rear cross slides prior to positioning said tools on said cross slides and a second jig for presetting tools for use on said turret. Both jigs include a reference surface simulating the datum plane so that tools preset on said jigs are easily and quickly positionable on the machine tool with reference to the datum plane. The apparatus further includes a datum surface transfer arm having a transfer surface adapted to lie on the datum surface, and means for mounting said transfer arm on the turret so that the transfer arm is operable to facilitate positioning the tools on the cross slide.

3,625,098
DEVICE ADAPTABLE TO THE HEADSTOCK OF ENGINE-LATHES ENABLING THE HEIGHT OF THE MACHINE GEOMETRIC AXIS
Romeu Romi, Santa Barbara d'Oeste, Sao Paulo, Brazil, assignor to Industrias Romi S.A.
Filed Sept. 3, 1969, Ser. No. 854,899
Claims priority, application Brazil, Sept. 5, 1968, 202,046
Int. Cl. B23b *19/00*
U.S. Cl. 82—28 **5 Claims**



The geometrical axis of a lathe is raised to the level of a spindle offset to the main spindle, and supported on the headstock of the lathe. A gear transmission connects a gear wheel secured to the main shaft with a gear secured to the offset spindle, and has such a number of gears that the offset spindle rotates in the same sense as the main spindle, permitting the attachment of a chuck to the offset spindle.

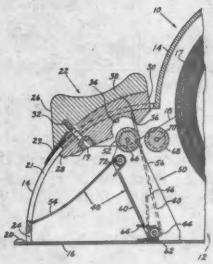
3,625,099
CORRUGATED THIN GAUGE WEB CUTTING METHOD AND APPARATUS
Takehisa Mase and Hirosi Kawaura, Kariya-shi, and Terumoto Yamaguchi and Yosinao Amano, Anjo-shi, Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan
Filed Apr. 8, 1970, Ser. No. 26,595
Int. Cl. B26d *5/20*
U.S. Cl. 83—13 **3 Claims**



A method of and apparatus for automatic high speed cutting of a corrugated thin gauge web produced and supplied continuously by a corrugated thin gauge web producing machine for producing a predetermined length of web having a fixed number of corrugations of a predetermined pitch adapted for use as a fin material with heat exchangers. The apparatus comprises a feed worm wheel disposed above the path of travel

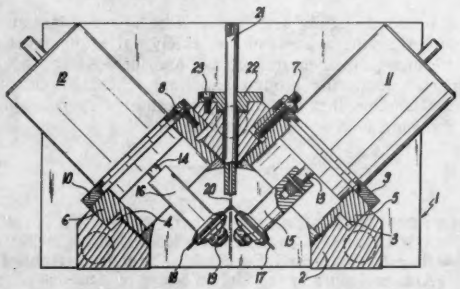
of the corrugated thin gauge web and formed with a number of teeth for giving a uniform pitch to the corrugations of the corrugated thin gauge web, a pair of guide gears disposed posterior to the feed worm wheel and arranged on opposite sides of the path of travel of the corrugated thin gauge web for engaging the opposite sides of a predetermined length of web having a fixed number of corrugations to bring the pitch of the corrugations of the predetermined length of web into means for severing the length of web having the fixed number of corrugations of the predetermied pitch from the rest of the corrugated thin gauge web.

3,625,100
TAPE DISPENSER
David I. Barnard, 360 Jasmine St., Denver, Colo. 80220
Filed Sept. 11, 1969, Ser. No. 857,011
Int. Cl. B65h *51/18*
U.S. Cl. 83—205 **6 Claims**



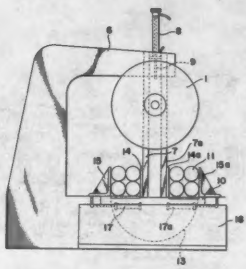
A tape dispenser in which tape in any desired length is stripped from a supply roll by a positive gripper, presented outside the dispenser by a spring-type extruder, and severed from the supply roll by a cutter blade carried on an operating button.

3,625,101
WIRE-CUTTING MACHINE
Jean Leveque, Paris, France, assignor to Commissariat a l'Energie Atomique, Paris, France
Filed Mar. 31, 1970, Ser. No. 24,217
Claims priority, application France, Apr. 4, 1969, 6910211
Int. Cl. B23d *25/00*
U.S. Cl. 83—355 **4 Claims**



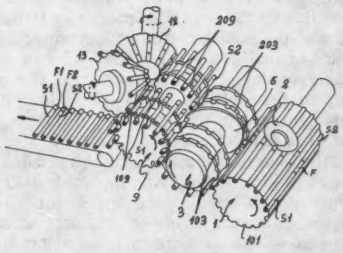
The machine makes it possible to cut a wire by shearing at a precise point along the length of the wire without subjecting this latter to any longitudinal stress. Two rotary cutters mounted on the ends of the driving shafts of two impulse or stepping motors carry out identical movements but in opposite directions, the driving shafts being disposed on each side of the wire to be cut at an opposite angle of inclination with respect to the wire.

3,625,102
CIRCULAR SAWING MACHINE WITH A PAIR OF VISES
Fumio Shiino, 34–3, 4-chome, Egota, Nakano-ku, Tokyo, Japan
Filed Oct. 3, 1969, Ser. No. 863,552
Claims priority, application Japan, Oct. 5, 1968, 43/72,418
Int. Cl. B23d *45/02;* **B27b** *5/18*
U.S. Cl. 83—460 **4 Claims**



This disclosure relates to a circular sawing machine with a pair of vises comprising a circular saw driven with a pressure oil motor, guide members guiding said circular saw and pressure oil motor integrally, and vises for holding the works on both sides of said guide members, and the object of this invention is to provide a machine which is made of simple construction, and in which efficiency and accuracy of cutting are obtained due to the cutting on two positions on both sides of the moving line.

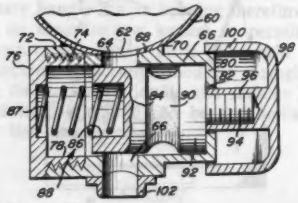
3,625,103
CIGARETTE TURN AROUND
Filippo Giatti, Bologna, Italy, assignor to AMF Incorporated
Filed Apr. 6, 1970, Ser. No. 25,869
Claims priority, application Italy, Apr. 30, 1969, 6,992/69
Int. Cl. B26d *1/14*
U.S. Cl. 83—102 **13 Claims**



This disclosure relates to a device for cutting a single row of two axially aligned cigarettes having an interposed double length filter plug in half to form two rows, each

row being fed to a grooved drum, two grooved drums being used to space and offset the severed cigarettes. The drums are mounted to rotate freely at different speeds about a common axis and are spaced longitudinally from each other, the drums having a different number of grooves. A turn around device is coupled to pick up the cigarettes of one row, turn them around, and thereafter position them between the cigarettes of the other row.

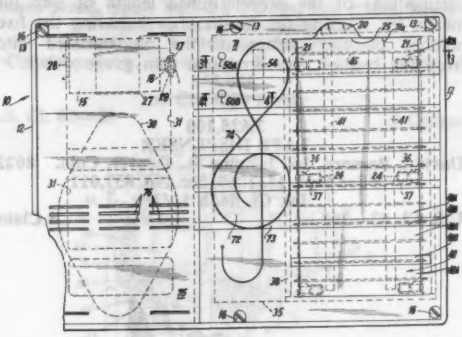
3,625,104
WATER KEY FOR BRASS WIND MUSICAL INSTRUMENTS
Raymond A. Amado, 9 W. Broad St., Haverstraw, N.Y. 10927
Filed May 12, 1970, Ser. No. 36,577
Int. Cl. G10d *7/10*
U.S. Cl. 84—397 **10 Claims**



A fluid release valve for brass wind instruments (cornets, trumpets, trombones and the like) commonly known as a water key but distinct and different from the conventional pivoted lever-type water key. It comprises a valve body embodying a cylinder and an enclosed spring-loaded piston which reciprocates in the cylinder and which simultaneously opens and closes diametrically opposite fluid inlet and discharge ports and has a push-button-type finger-piece at a readily accessible end of the valve body.

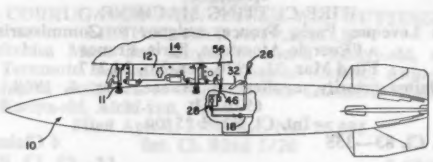
3,625,105
INSTRUMENT FOR TEACHING COORDINATION BETWEEN WRITTEN STAFF NOTES AND CORRESPONDING MUSICAL TONES
Robert B. Dingwall and William B. Reimann, Mahopac, and Carmino C. Ravosa, Briarcliff Manor, N.Y., assignors to Stanbow Productions, Inc., Valhalla, N.Y.
Filed Oct. 9, 1969, Ser. No. 865,133
Int. Cl. G09b *15/04*
U.S. Cl. 84—471 **12 Claims**

An instrument for teaching a pupil coordination between notes written on the lines and spaces of a staff, as in sheet music, and the actual corresponding musical tones, has a housing including a panel formed with an opening and preferably having a clef sign adjacent the opening. A plurality of relatively elongated substantially rectangular keys are arranged in the opening and include alternating narrow keys and wide keys to stimulate the alternating lines and spaces of a musical staff. An oscillator, a sound transducer and a battery are mounted in the housing. A printed circuit board is supported within the housing on a pair of spaced strips of resilient material, and a second pair of spaced strips of resilient material support the keys on the upper surface of the printed circuit board. The battery has one terminal grounded to the housing and its other terminal electrical connected to the printed circuitry. A tapped resistance is connected to the oscillator input, and is associated with a condenser to provide an R-C member. The value of the R-C member controls the frequency of the oscillator. Each key has an electrically conductive strip on its lower surface which, when the key is depressed, connects a respective tap of the resistance to the ungrounded terminal of the battery. As each key is depressed, the printed circuit board is first moved slightly inwardly to connect printed circuitry on its undersurface



to metal tabs forming part of the metal housing. A pair of resistances are included in series with the tapped resistance, and one of this pair of resistances is controlled by a "sharp" key and the other by a "flat" key. When either the "sharp" key or the "flat" key is operated, the oscillator frequency is changed by a half-tone.

3,625,106
PARACHUTE DEPLOYMENT SAFETY APPARATUS
Frank Russo, 4008 Ridge Road, Annandale, Va. 22003, and Robert J. Scire, 1308 Michael Lane, Hixson, Tenn. 37343
Filed Feb. 26, 1970, Ser. No. 14,322
Int. Cl. B64d *1/04*
U.S. Cl. 89—1.5 D **4 Claims**

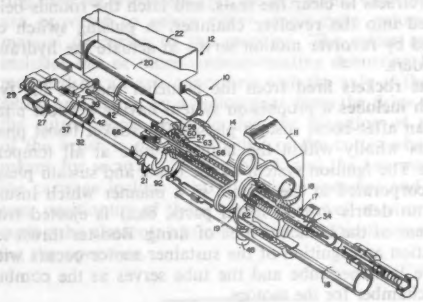


In combination with an aircraft-launched armament device having a parachute, a safety valve apparatus for preventing inadvertent release and deployment of the parachute during ground handling, or carrier catapults and landings that may otherwise cause personnel injuries and damage to stores and aircraft.

3,625,107
FEED MECHANISM FOR AN OPEN BREECH HIGH RATE AUTOMATIC ROCKET LAUNCHER
Arthur A. Smith and Corbet M. Cornelison, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army
Filed Nov. 3, 1969, Ser. No. 873,295
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.8 **2 Claims**

A feed mechanism for an automatic high rate, open breech, dual tube launcher. The launch tubes are fed by a

four-cylinder revolver which generates rotary reciprocating motion. Two rounds are loaded and two rounds are fired each half cycle. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chamber with the launching tubes while the second hydraulic cylinder performs the loading operation, reciprocates the revolver to seal and align the firing chambers with the launching tubes, and retracts to clear the seals, and latch the rounds being loaded into the revolver chamber. A pulsing switch operated by revolver motion serves to actuate the hydraulic cylinders. The feed mechanism includes a pair of loading chutes mounted on opposite sides of the second hydraulic cylinder. The rockets are carried in the chutes in stacked relation and a pair of pressure caps is attached to the tops of the loading chutes to maintain a predetermined amount of pressure on the rounds even during loading thereof.



The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.) is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

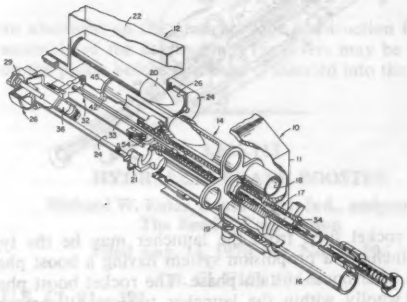
3,625,108

OPEN BREECH FOUR CYLINDER REVOLVER FOR A TWIN BARREL AUTOMATIC ROCKET LAUNCHER

Arthur A. Smith, Corbet M. Cornelison, and Charles Hill, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1969, Ser. No. 873,294
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.804 **6 Claims**

An automatic high rate, open breech, dual-tube launcher, fed by a four cylinder revolver which generates rotary reciprocating motion. Two rounds are loaded and two rounds are fired each half cycle. The four cylinder revolver is open breech for firing rockets and is provided with a sinusoidal cam track having a piston activated cam therein to provide rotary motion through a 90° arc to permit the loading of two rounds in the lateral cylinders while the two rockets in the vertical cylinders are being fired. The revolver is also disposed for reciprocating motion and also houses the lock and firing detents for holding the rounds in position while the firing current is applied. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chamber with the launching tubes while the second hydraulic cylinder performs the loading operation, reciprocates the revolver to seal and align the firing chambers with the lauching tubes, retracts to clear the seals, and latch the rounds being loaded into the revolver chamber. A pulsing switch operated by revolver motion serves to actuate the hydraulic cylinders. Details of the complete launcher system is more clearly set forth in the patent application filed of even date herewith by Corbet M. Cornelison and entitled "Open Breech High Rate Automatic Rocket Launcher."



The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.), is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,625,109

DETENT AND FIRING MECHANISM FOR AN OPEN BREECH HIGH RATE AUTOMATIC ROCKET LAUNCHER

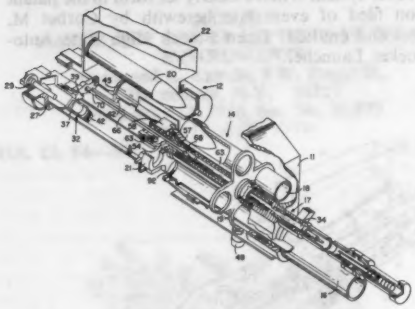
Corbet M. Cornelison, Huntsville, Ala., assignor to the United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1969, Ser. No. 873,419
Int. Cl. F41f *3/04*
U.S. Cl. 89—1.807 **2 Claims**

An open breech, high rate automatic rocket launching system wherein a pair of rockets are fired from a pair of revolver chambers aligned with a pair of launch tubes while, simultaneously, a second pair of rockets are loaded in a second pair of revolver chambers. More particularly, the invention relates to a detent and firing contact mechanism to provide a regulated restraining force to the rocket during the various phases of launcher operation and to provide the firing contact for firing the rockets.

The launcher is an automatic high rate, open breech, dual tube launcher, fed by a four cylinder revolver which generates rotary reciprocating motion. The revolver is provided with the mechanism of the present invention for retention therein of the rockets during the reciprocating motion and to effect firing of the rockets at a predetermined time. Two rounds are loaded in the revolver and

two are fired each half cycle. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chamber with the launching tubes while the second hydraulic cylinder performs the loading operation, reciprocates the revolver to seal and align the firing chamber with the launching tubes, and retracts to clear the seals, and latch the rounds being loaded into the revolver chamber. A pulsing switch operated by revolver motion serves to actuate the hydraulic cylinders.



The rocket fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal part, etc.) is ejected from the rear of the launcher tube on firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,625,110

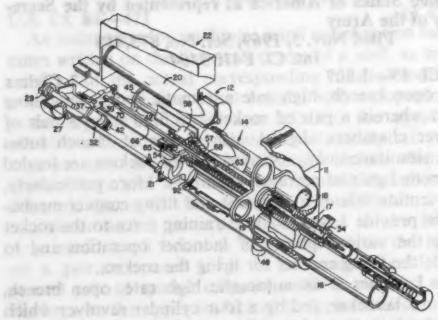
FIRING CIRCUIT AND SAFETY INTERLOCK FOR AN AUTOMATIC ROCKET LAUNCHER

Corbet M. Cornelison and Arthur A. Smith, Huntsville, Ala., assignors to the United States of America as represented by the Secretary of the Army

Filed Nov. 3, 1969, Ser. No. 873,425

Int. Cl. F41f *3/04*

U.S. Cl. 89—1.807 **4 Claims**



An open breech, high rate automatic rocket launching system wherein a pair of rockets are fired from a pair of revolver chambers aligned with a pair of launch tubes while, simultaneously, a second pair of rockets are loaded in a second pair of revolver chambers. More particularly, the invention relates to a firing circuit and safety interlock for such a rocket launcher which provides sequenced duration control electrical firing pulses to rockets, while maintaining electrical isolation of the rockets except in the selected firing position and time period.

The launcher is an automatic high rate, open breech, dual tube launcher, fed by a four cylinder revolver which generates rotary reciprocating motion. The revolver is provided with the mechanism of the present invention for retention therein of the rockets during the reciprocating motion and to effect firing of the rockets at a predetermined time. Two rounds are loaded in the revolver and two are fired each half cycle. A pair of hydraulic double acting cylinders actuated by a pair of solenoid valves serve to actuate the launcher. One hydraulic cylinder rotates the revolver to align the chamber with the launching tubes while the second hydraulic cylinder performs the loading operation, reciprocates the revolver to seal and align the firing chambers with the launching tubes, and retracts to clear the seals, and latch the rounds being loaded into the revolver chamber. A pulsing switch operated by revolver motion serves to actuate the hydraulic cylinders.

The rockets fired from the launcher may be the type which includes a propulsion system having a boost phase and an after-boost sustain phase. The rocket boost phase occurs wholly within the launcher tube at all temperatures. The ignition system of the boost and sustain phases is incorporated in the system in a manner which insures that no debris (wires, metal parts, etc.) is ejected from the rear of the launcher tube of firing. Booster thrust termination and ignition of the sustainer motor occurs within the launcher tube and the tube serves as the combustion chamber for the motors.

3,625,111

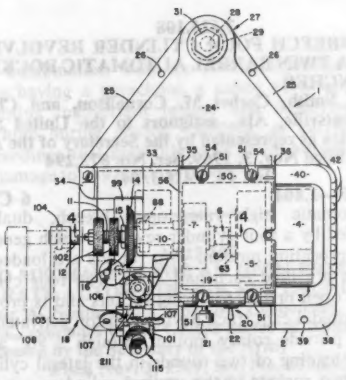
KEY DUPLICATING MACHINE

Louis D. Carlo, Cleveland, Harold L. Baker, Warrensville Heights, and Philip C. Hungerford, Jr., Cleveland Heights, Ohio, assignors to Cole National Corporation

Filed Oct. 6, 1969, Ser. No. 863,782

Int. Cl. B23c *1/16*

U.S. Cl. 90—13.05 **11 Claims**



An automatic key duplicating machine which causes a key blank in a fixed position relative to a key master to

traverse a rotating cutting member and one or more deburring brushes to duplicate the configuration of the key master on the key blank. Both the master and the blank are fixed relative to one another on a member forming part of carriage means which are capable of linear translatory motion with respect to the apparatus support means, the cutting member and the brushes. Means, including a cam and drive assembly, are disclosed for translating the rotational movement of a gear drive mechanism to cause the linear motion of a carriage member. The cam assembly includes a barrel cam having a continuous groove and also includes a cam follower fixed in the groove to impart the linear motion to the carriage when automatic operation is desired. The groove in the cam has a spiral portion to guide the cam follower during automatic operation of the machine and an axial portion which permits manual operation of the machine and free return of the carriage after automatic operation. Biasing means are provided to maintain the force of the keys and the carriage means against the stationary guide blade engaging the serrations on the key master and the rotating cutting member which engages the key blank. Control means are provided to select either single-cycle automatic or manual operation of the machine. The cutter assembly includes one or more counter-rotating deburring brushes mounted on an axis concentric with the axis of the cutter wheel and driven by a pinion gear from the drive gear on the cutter motor shaft so that the direction of rotation of the brush is opposite to that of the cutter wheel. The means for securing the key blank and the key master on the carriage include a novel locking member and permit easy positioning of those elements as well as strongly securing the elements against inadvertent displacement during the operation.

3,625,112

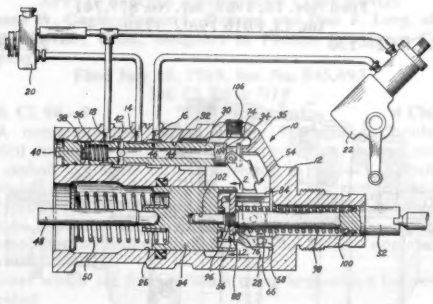
HYDRAULIC BRAKE BOOSTER BLIND ASSEMBLY

Arthur K. Brown, South Bend, Ind., assignor to The Bendix Corporation

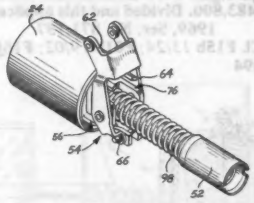
Filed Feb. 25, 1970, Ser. No. 14,133

Int. Cl. F15b *13/10*

U.S. Cl. 91—391 **6 Claims**



A hydraulic boost device is disclosed which includes a housing defining a stepped bore having larger and smaller diameter sections. Valve means are provided in the housing to control communication of the bore with a source of pressurized fluid. A pair of valve-operating levers are pivotally mounted on the piston and interconnect the lever with the valve means and with a plunger operated by the vehicle operator. The plunger extends through an aperture in a plate that is pivotally mounted on the levers. A resilient member urges the plate into engagement with



an abutment on the plunger. This construction facilitates assembly of the device, since the levers may be mounted on the piston before the latter is inserted into the housing.

3,625,113

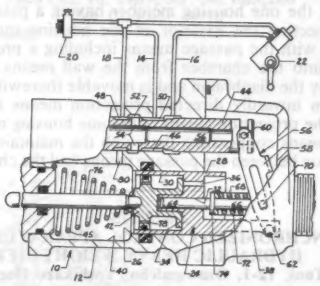
HYDRAULIC BRAKE BOOSTER

Richard W. Euler, South Bend, Ind., assignor to The Bendix Corporation

Filed Aug. 24, 1970, Ser. No. 66,296

Int. Cl. F15b *13/10*

U.S. Cl. 91—391 **9 Claims**



A hydraulic boost device is disclosed which includes a housing defining a bore therewithin, and a piston slidable in the bore. A valve is provided within the housing that communicates pressurized fluid into the bore for shifting the piston to assist the vehicle operator when the brakes of the vehicle are applied. The piston includes a pair of relatively movable portions. One of the portions is provided with fluid passages extending therethrough that communicate fluid through the piston from one end of the bore to the other end of the bore. The other portion of the piston is yieldably biased towards a position closing the passages so that when fluid pressure is admitted to the bore the piston shifts as a unit. Operator-actuated means are provided to operate the valve. However, if the valve malfunctions, the operator-actuated means engages the piston so that the brakes of the vehicle may be applied manually. When this occurs, one portion of the piston is moved relative to the other portion of the piston to open the passages and thereby permit fluid communication through the piston. This feature prevents an abrupt application of the brakes should the valve resume functioning after a manual brake application has been initiated.

3,625,114

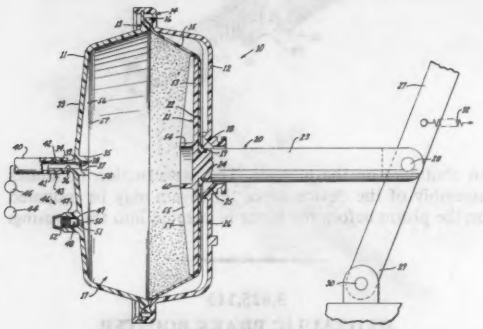
FLUIDICALLY OPERATED ACTUATOR MEANS OR THE LIKE

Robert L. Golden, Greensburg, Pa., assignor to Robertshaw Controls Company, Richmond, Va.

Original application Dec. 5, 1966, Ser. No. 599,064, now Patent No. 3,483,800. Divided and this application Sept. 23, 1969, Ser. No. 871,157

Int. Cl. F15b *15/24;* **F01b** *19/02;* **F16j** *3/00*

U.S. Cl. 91—394 **12 Claims**



This disclosure relates to a pneumatically operated actuator having two cup-shaped housing members snap fitted together at the open ends thereof and sealingly holding an outer periphery of a flexible diaphragm between flange means of the housing members, each flange means having an outwardly directed rib offset relative to the rib of the other flange means and respectively compressing into the outer periphery of the flexible diaphragm. The diaphragm cooperates with one of the wall means to define a chamber therebetween, the one housing member having a passage means interconnecting the exterior of the housing means to the chamber with the passage means including a projection extending into the chamber from the wall means. A plate is carried by the diaphragm and is movable therewith, the plate having an inwardly directed projection means for abutting against the projection means of the one housing member and having means cooperating therewith the maintain fluid communication between the passage means and the chamber.

3,625,115

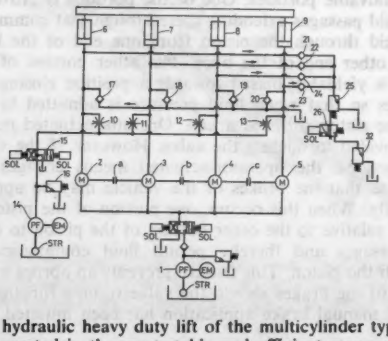
SYNCHRONIZED CONTROL APPARATUS FOR HYDRAULIC HEAVY WEIGHT LIFT

Shoichi Tani, 12-1, Ozawamicho; Yoshikazu Horikawa, 8-1, 1-chome, Ozawamicho, both of Tobata-ku, Kitakyushu-shi, Fukuoka-pref.; Ichiro Goshima, 2-chome, Tenjin-sho, Yawata-ku, Kitakyushu-shi, Fukuoka-pref.; Kiyomitsu Araki, 2-17, Minamikamato, and Yoshitake Nakamura, 3-32-16, Omoriminami, both of Ota-ku, Tokyo, all of Japan

Continuation-in-part of application Ser. No. 808,809, Mar. 20, 1969, now abandoned. This application Dec. 5, 1969, Ser. No. 882,492

Int. Cl. F15b *11/22*

U.S. Cl. 91—411 B **2 Claims**



A hydraulic heavy duty lift of the multicylinder type may be operated in the most stable and efficient manner in accordance with the synchronized control apparatus of this invention in which the control apparatus comprises interconnected hydraulic motors, independent flow rate compensating circuits for the hydraulic motors, release circuits to release the excess liquid in preceding cylinders at the highest terminal position, a common adjusting circuit for even loading at the starting position, liquid feeding circuits to avoid the evacuation caused by the preceding cylinder at the lowest terminal position.

3,625,116

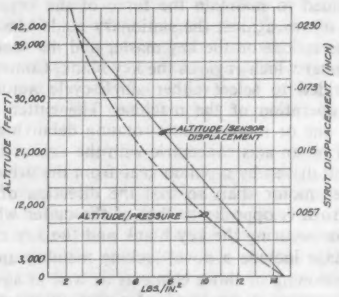
PRESSURE-SENSING DIAPHRAGM

Stephen A. Hluchan, Riverside, Calif., assignor to Bourns, Inc.

Filed Sept. 15, 1969, Ser. No. 858,055

Int. Cl. F01b *19/00;* **G01l** *7/20, 7/08*

U.S. Cl. 92—104 **6 Claims**



A diaphragm-type sensor comprising an integral one-piece diaphragm the central portion of which is a flat flexible disc and the outer portion of which consists of an annular peripheral rim portion and inwardly thereof an annular corrugated portion encircling the flat disc portion and consisting of a plurality of annular conical sections, the arrangement being such that displacements of the center of the diaphragm are linearly related to changes of a physical quantity which is nonlinearly related to variation of the summation of the forces acting on the face of the sensor diaphragm.

3,625,117

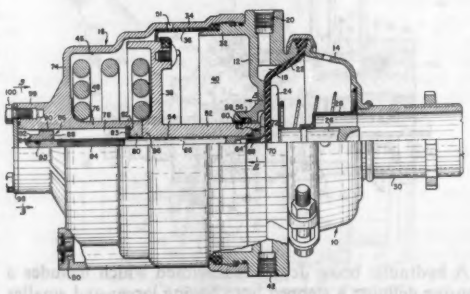
MECHANICAL RELEASE MEANS FOR SPRING APPLIED, FLUID PRESSURE RELEASED ACTUATORS

William N. Tazelaar, Elyria, Ohio, assignor to Bendix-Westinghouse Automotive Air Brake Company, Elyria, Ohio

Filed Nov. 18, 1969, Ser. No. 877,741

Int. Cl. F01b *19/02, 31/00*

U.S. Cl. 92—130 **2 Claims**



A threaded rod carried by a spring applied actuator and extending rearwardly into a fixed cylindrical socket of greater diameter than the shaft and having a shoulder at the forward end of the socket, a nut carried on the threaded shaft within the socket and having a cylindrical bearing surface engaging the socket wall and tool receiving means engageable through the open rear end of the socket to rotate

the nut against the shoulder to draw the shaft and actuator against the opposing force of the spring.

3,625,118

MANUFACTURE OF FILTERS FOR CIGARETTES OR LIKE SMOKING ARTICLES

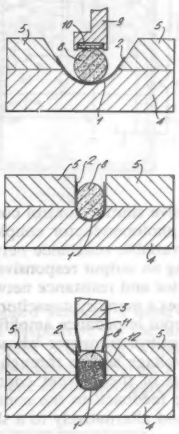
Norman Walter Jackson, London, England, assignor to The Molins Machine Company Limited, London, England

Continuation-in-part of application Ser. No. 753,532, Aug. 19, 1968, now abandoned. This application Feb. 7, 1969, Ser. No. 797,435

Claims priority, application Great Britain, Feb. 16, 1968, 7767/68

Int. Cl. B65b *1/06, 1/24;* **B31f** *7/00*

U.S. Cl. 93—1 C **15 Claims**



Making cigarette filters consisting of two filter plugs wrapped in a tube to define a compartment in which there is particulate filtering material, by the method of deforming the plugs and surrounding wrapper to increase the useful volume between the plugs into which the particulate material can be deposited, and then reforming to the desired shape, thus increasing the volume of particulate material in the finished filter and improving its efficiency.

3,625,119

SURFACE APPLICATIONS SUCH AS BRIDGE DECK COVERING, PAVEMENT PATCHING, ROOFING APPLICATIONS AND OTHER COVERINGS

Duane W. Gagle; Homer L. Draper, and Dale F. Levy, all of Bartlesville, Okla., assignors to Phillips Petroleum Company

Filed July 28, 1969, Ser. No. 845,493

Int. Cl. E01c *7/18*

U.S. Cl. 94—9 **4 Claims**

A nonheat-sealed polypropylene fabric, e.g., nonheat-sealed nonwoven polypropylene mat or fabric, is used within an asphalt aggregate surface covering. A cutback asphalt or asphalt emulsion is spread, a mat of nonheat-sealed polypropylene fabric is laid into the asphalt, further adhesive can be applied together with aggregate and finally, the mass is smoothed by rolling to make the final surface application covering.

Blisters which are formed when using heat-sealed fabric are avoided.

3,625,120

ROAD REPAIR TRUCK

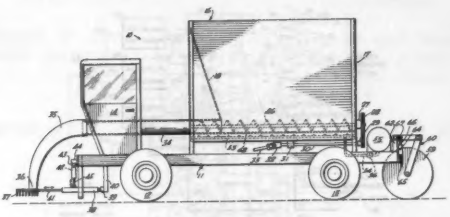
Joseph Nagy, Rte. 3, P.O. Box 412, Newfoundland, N.J.

Filed June 30, 1970, Ser. No. 51,079

Int. Cl. E01c *23/00*

U.S. Cl. 94—39 **7 Claims**

A vehicular truck equipped for road repair work is described, including a repair materials hopper, a front discharge chute and a drive worm conveyor mechanism for transporting road repair material from the hopper through the chute for deposit in a pavement "pothole" or the like to be repaired, is described. The discharge end of the material chute carries a rake movable up and down, from side-to-side and from front-to-back, through the use of hydraulic piston control mechanism controllable by a single operator in the



truck cab, for spreading the deposited material evenly over the pavement defect being repaired. A hydraulically controlled roller, also controlled by the single operator in the cab, is mounted at the rear end of the truck for use in rolling the deposited and raked repair material to complete the road repair operation.

3,625,121

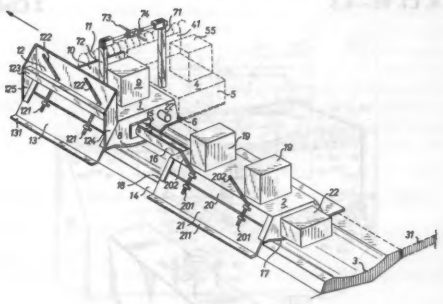
APPARATUS FOR PRODUCING SUPPORTING LAYERS OR ROAD SURFACES

Mathias Blumer, Hunibach, and Walter Gasser, Gwatt, both of Switzerland, assignors to Frutiger Sohne AG., Thun, Switzerland

Filed Oct. 10, 1969, Ser. No. 865,280

Int. Cl. E01c *19/30*

U.S. Cl. 94—48 **1 Claim**

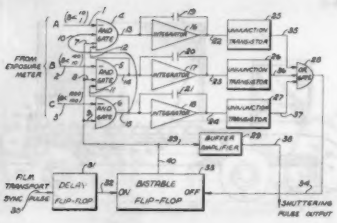


There is disclosed a method for producing bituminous layers having at least one marginal rim, curbing, shoulder, gutter or other profiled edge configuration, termed abutment, in which bituminous mix is laid out over the area of the road and the area of the abutment with the abutment being shaped to the desired profile and simultaneously precompacted. Another aspect of the method includes subjecting the shaped and precompacted abutment to a second precompacting step. The method includes applying additional heat to the mix of the abutment during either or both precompacting steps. There is also disclosed apparatus for carrying out the method including a means for laying out and precompacting an area of the bituminous layer, a laterally connected and relatively movable guide plate for shaping the desired profile, a profiled drag plate connected to the guide plate in trailing relation therewith and vibrating and heating means operably associated with either one or both of the guide and drag plate.

3,625,122
ELECTRONIC PULSE GENERATING AND CONTROL SYSTEM FOR SHUTTERING AN IMAGE INTENSIFIER

Sergio F. Valdes, Saugus, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 15, 1970, Ser. No. 46,262
Int. Cl. G03
U.S. Cl. 95—1 10 Claims



An automatic camera shuttering system particularly adapted for aerial photography in that it is continuously operative over a wide range of ambient light levels on a frame-to-frame basis. The scene to be photographed is imaged on a photo-cathode surface, passed through an electron image intensifier and thereafter imaged in intensified form on an output phosphorescent screen adjacent to the film.

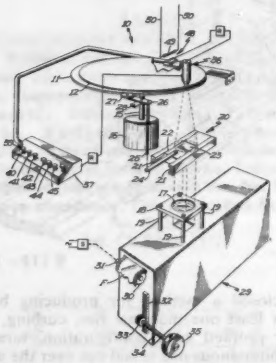
During each frame, a shuttering pulse of a duration which is a function of the output of a light measuring transducer, is generated and applied to the image intensifier to control the intensified image "on time."

The light transducer output is broken into a plurality of decade ranges and the pulse generating circuit is thereby adapted to handle wide variations of light and generate corresponding inversely related shuttering pulse durations.

3,625,123
PHOTO-SETTING DEVICE

Harvey D. Smalley, Perham, Minn.

Filed May 26, 1969, Ser. No. 827,803
Int. Cl. B41b *13/00, 15/00, 17/00*
U.S. Cl. 95—4.5 2 Claims

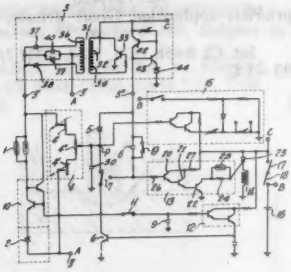


A photo-setting device includes a revolvable disc having symbols, such as letters, numbers, and the like, affixed thereto, and having opaque coated indicia thereon in a transparent background along the periphery corresponding to and adjacent each symbol. A photographic lens is positioned adjacent one surface of the disc and an instantaneous flashing strobe unit is positioned adjacent the other surface of the disc to permit a film to receive a photographic image of a symbol from the lens. A photoelectric cell sensor mechanism is provided and cooperates with the keyboard for rapidly selectively causing the strobe unit to be energized for selectively photographing symbols.

3,625,124
SHUTTER TIMING MECHANISM USING INVERSE FEEDBACK CIRCUIT

Seinan Miyakawa, Tokyo-to, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed June 26, 1969, Ser. No. 836,928
Claims priority, application Japan, July 3, 1968, 43/45879
Int. Cl. E01c *7/10*
U.S. Cl. 95—10 C 6 Claims

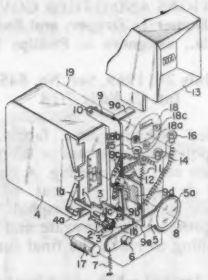


A light responsive shutter control comprises a control circuit including a photoconductor coupled to a log compression network, a variable resistance network and a transistor network providing an output responsive to the resistances of the photoconductor and resistance network. The control circuit output charges a memory capacitor connected across the input of a high input impedance amplifier whose output controls a current control transistor whose output electrode is connected to a voltage source through a log expansion network. The output of the current control transistor is connected in inverse feedback to the control circuit and to indicating means and alternatively to a shutter release control transistor switch.

3,625,125
CAMERA HAVING AN AUTOMATIC INDICATOR OF LIGHTING SOURCE

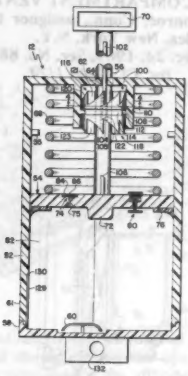
Yozo Iida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 4, 1969, Ser. No. 847,113
Claims priority, application Japan, Aug. 8, 1969, 43/55863
Int. Cl. G03b *11/00, 17/18*
U.S. Cl. 95—11 R 6 Claims



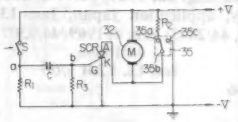
The camera of this invention provides a member for sensing the film type loaded by receiving a signal from the film cartridge, and an operational lever receiving a signal directly or indirectly from an artificial lighting source. With this provision, a spectral sensitivity conversion filter is pivoted in or out of the phototaking light path. According to this invention, with the aid of signals from the sensing member and operational lever, a mark expressing daylight light source, artificial light source or inadequacy for phototaking is selectively indicated to a photographer.

3,625,126
PHOTOGRAPHIC PROCESSING APPARATUS INCLUDING AUTOMATIC TIMER
Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.
Filed July 31, 1969, Ser. No. 846,394
Int. Cl. G03b *17/52*
U.S. Cl. 95—13 **17 Claims**



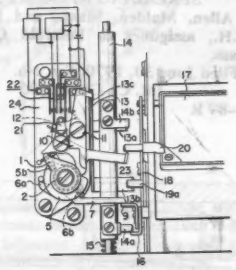
An indicator interposed between a hand strap and a self-developing camera is responsive to the exertion and subsequent release of forces producing withdrawal of photographic materials to automatically provide a signal when time required for development of the photographic materials has elapsed.

3,625,127
AUTOMATIC RELEASE MECHANISM OF AN ELECTRONIC SHUTTER
Hiroshi Tsuda, Tokyo, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Mar. 16, 1970, Ser. No. 19,790
Int. Cl. G03b *17/40*
U.S. Cl. 95—53 E **2 Claims**



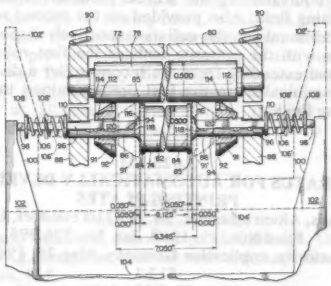
Automatic release mechanism for a camera mounted on a microscope for photographing an object while the same is being observed. A shutter release member is actuated by a cam rotated by a motor so as to open the shutter blades during one revolution of the cam. A manually operable switch controlling the motor is located so near the focusing knob of the microscope that the switch may be simultaneously operated with the knob. A resistor is connected in series with the switch so that the voltage across the terminals of the resistor when the switch is closed is applied to a pulse-producing circuit, the output pulse of which is applied to the gate electrode of a silicon-controlled rectifying element connected in series to the motor thereby starting the motor. When the movable contact of a SPDT switch is shifted by the rotation of the aforementioned cam, the rectifying element is short-circuited. After the cam has made a complete revolution, the SPDT switch connects a resistor in parallel to the motor so that the motor is stopped in the initial position of the cam, whereby the mechanism is ready for the next operation of the shutter.

3,625,128
CAMERA SELF-TIMER
Katsuhiko Nomura, and Tadazumi Sakazaki, both of Tokyo-to, Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, both of Tokyo-to, Japan
Filed Feb. 18, 1969, Ser. No. 800,190
Claims priority, application Japan, Feb. 22, 1968, 43/10789
Int. Cl. G03b *9/64*
U.S. Cl. 95—53.3 **9 Claims**



A camera self-timer includes a spring-wound timing motor, a motor brake and a spring-raised shutter release rod. The depressing of the rod releases the brake and activates means for locking the rod in a depressed condition when the motor is charged. The closing of the camera shutter releases the rod to its raised condition and brakes the motor. The discharge of the timing motor releases the shutter. When the timing motor is in a discharged condition the shutter may be released merely by depression of the shutter release rod.

3,625,129
PHOTOGRAPHIC FLUID-SPREADING APPARATUS
David Van Allen, Malden, Mass., assigne to Polaroid Corporation, Cambridge, Mass.
Filed June 30, 1970, Ser. No. 51,164
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 R **20 Claims**



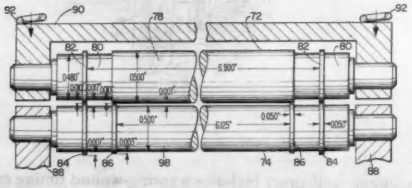
Photographic apparatus for alternately distributing processing fluid in a layer having a first predetermined thickness and in a layer having a second predetermined thickness less than such first predetermined thickness between sheet materials of a predetermined width. A first roller has a facing surface extending a distance greater than the width of such materials. A second roller is positioned in juxtaposed relationship thereto and has a shorter facing surface and collars at each end thereof spaced a distance apart less than the width of such sheet materials and extending from that facing surface and a radial distance substantially equal to such second predetermined fluid thickness. Movable annular collars are mounted on respective shafts of the second roller for simultaneous displacement between first positions wherein sheet-contacting surfaces thereof are spaced apart a distance greater than the width of such sheet materials and second positions wherein their sheet-contacting

surfaces are spaced apart a distance less than such width. These sheet-contacting surfaces on the movable rollers are disposed a radial distance from the facing surface of the second roller substantially equal to such first predetermined thickness of fluid. The two rollers are continually yieldably urged towards each other.

3,625,130
STEPPED PHOTOGRAPHIC PROCESSING FLUID-SPREADING APPARATUS

David Van Allen, Malden, Mass., and Frank W. Knight, Salem, N.H., assignors to Polaroid Corporation, Cambridge, Mass.

Filed June 30, 1970, Ser. No. 51,170
Int. Cl. G03d *3/00*
U.S. Cl. 95—89 R **21 Claims**

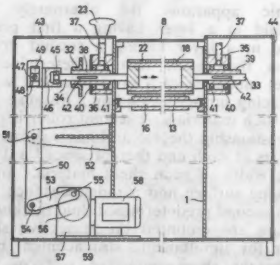


Apparatus for alternately distributing processing fluid in a layer having a first predetermined thickness between a first pair of sheet materials and in a layer having a second predetermined thickness greater than such first predetermined thickness between a second pair of sheet materials. To facilitate these operations, the width of the second pair of sheet materials is greater than the width of the first pair of sheet materials. A first roller includes a facing surface slightly shorter in length than such first predetermined width disposed between two reduced end portions thereof. A second roller is disposed in parallel alignment with the first roller, and an arrangement is included for yieldably urging the rollers toward one another. The rollers include annular collars spaced a distance apart greater than such first predetermined width but less than such second predetermined width and which serve to establish a minimum spacing between the two facing surfaces of the juxtaposed rollers substantially equivalent to the second predetermined thickness of processing fluid. Also provided on the second roller are a pair of additional annular collars respectively disposed in juxtaposition with the opposite ends of the first roller's facing surface and extending from the second roller a distance substantially equivalent to the first predetermined thickness of processing fluid.

3,625,131
APPARATUS FOR AUTOMATICALLY DEVELOPING PRINTING PLATES

Ewald Puls, Altenrather Str. 30, D 521 Troisdorf, Germany

Filed Nov. 19, 1968, Ser. No. 776,995
Claims priority, application Germany, May 28, 1968, P 17 72 512.1
Int. Cl. G03d *5/06*
U.S. Cl. 95—89 R **14 Claims**

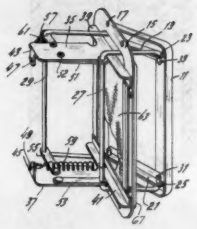


An apparatus for the automatic developing of printing plates wherein at least two distributing rollers are positioned above a conveyor belt adapted to carry the printing plates to be processed, with each roller being mounted for rotation in a direction opposite to the direction of travel of the conveyor belt and being axially slidable transversely of the belt thereby to apply the developer uniformly to the surface of the plates in a manner similar to prior manual methods.

3,625,132
VEHICLE COMPARTMENT VENTILATOR

Peter B. Smith, Monroe, Conn., assignor to Dynamics Corporation of America, New York, N.Y.

Filed Dec. 24, 1969, Ser. No. 887,958
Int. Cl. B60h *1/24*
U.S. Cl. 98—2 A **7 Claims**



A ventilator for providing ventilation to the interior compartments of vehicles which will pass air in either direction therethrough. A cover on one side of an aperture is connected to a pair of C-shaped rods which pass through the aperture. Each rod is connected to a pair of arms pivotally attached to a brace extending on the opposite side of the aperture from the cover. Spring means bias the rods so as to maintain the cover in either a closed or open condition.

3,625,133
AIR-CURTAINING APPARATUS FOR FORMING AN INTERNAL-ISOLATED ZONE

Taro Hayashi, Osaka-shi, Osaka, Japan, assignor to Sanko Air Plant Ltd., Osaka-shi, Osaka, Japan

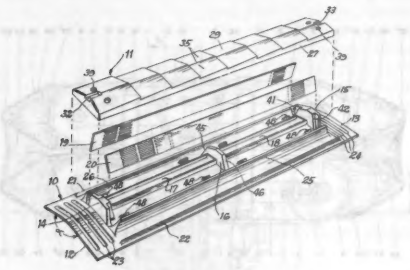
Filed Aug. 22, 1969, Ser. No. 852,334
Claims priority, application Japan, Jan. 13, 1969, 44/2842; Jan. 13, 1969, 44/2843; Feb. 4, 1969, 44/8307; Feb. 13, 1969, 44/10666
Int. Cl. F24f *9/00*
U.S. Cl. 98—36 **5 Claims**

An apparatus for forming an air curtain encircling an internal zone completely isolated from surroundings. In preferred embodiment, a stratospheric air flow is simultaneously supplied into the isolated internal zone for removing harmful gaseous contaminant produced therein. Dimension of the air curtain forming air exhaust opening is selected in relation to the shuttering distance and that of the supply opening by application of critical mass flow ratio method theory.

3,625,134
ROOF RIDGE VENTILATOR

Lester L. Smith, Peoria, Ill., assignor to Home Comfort Products Co., Princeville, Ill.

Filed Jan. 2, 1970, Ser. No. 16
Int. Cl. F24P *7/02*
U.S. Cl. 98—42 **11 Claims**

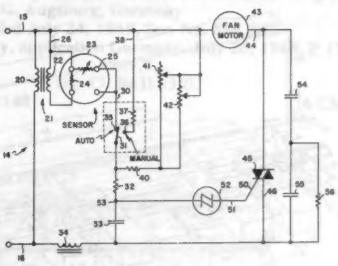


A roof ridge ventilator made of molded plastic parts except for louvered metal sheets closing the open sides of the ventilator, the design providing a low silhouette with a large air flow area through the louvered sheets by sloping the louvered sheets. Stiffness is built into the thin flashing forming part of the ventilator by molding beads into the flashing to inhibit buckling, particularly under extremes of temperature. The ventilator is formed from two molded parts to one of which the louvered sheets which, when fastened together, form a unit which may be installed in multiples to cover any desired length of roof ridge vent opening.

3,625,135
AUTOMATICALLY CONTROLLED COOKING AREA VENTILATING SYSTEM

Elmer A. Carlson, Richfield, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Apr. 22, 1970, Ser. No. 30,738
Int. Cl. F23j *11/00*
U.S. Cl. 98—115 **6 Claims**



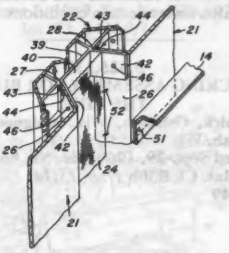
A cooking area ventilating system which operates automatically through the expedient of an aerosol particle sensor. The system operates automatically in response to aerosol particles or smoke, and has a varying speed for the ventilator fan depending on the concentration of the particles that are to be removed by the ventilating system.

3,625,136
LOUVER ASSEMBLY

Oliver Dininno, Baden, Pa., assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed Dec. 10, 1969, Ser. No. 883,936
Int. Cl. F24f *13/08*
U.S. Cl. 98—121 **9 Claims**

A louver assembly for a building wall or the like, including inner blades which are spaced apart to provide longitudinal openings for ventilating the building, and outer blades which confront the longitudinal openings. A strip of wire mesh confronts each longitudinal opening and prevents ingress of extraneous material, such as debris and birds for example.

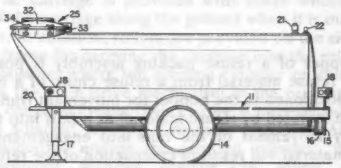


Bracket means connects each outer blade directly to adjacent ones of the inner blades. The bracket means fixes the spacing between adjacent inner blades and the spacing between the inner blades and the outer blades.

3,625,137
TANK TRAILER

Wallace J. S. Johnson, Berkeley, Calif., assignor to Up-Right, Inc., Berkeley, Calif.

Filed Oct. 13, 1969, Ser. No. 865,900
Int. Cl. A23l *3/00*
U.S. Cl. 99—271 **7 Claims**

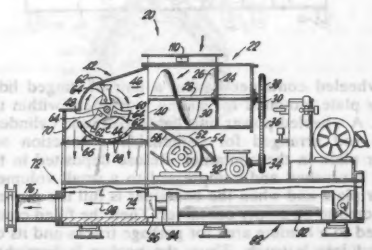


An enclosed tank trailer, balanced and tiltable about a central wheeled axle, and with a filling inlet at its top in vertical alignment with its towing hitch, which can be filled with crushed grapes as it is towed, then tilted one way for transportation to prevent seeds from settling in the outlet, tilted the other way for gravity discharge of the contents, and in which inert gas is used to prevent entry of oxidizing air into the tank at all times during filling, transportation and discharge and is used to discharge the contents from the tank.

3,625,138
WASTE DISPOSAL

David Shinn, Oakhurst, and George McCullough, Oceanport, both of N.J., assignors to Electronic Assistance Corporation, Red Bank, N.J.

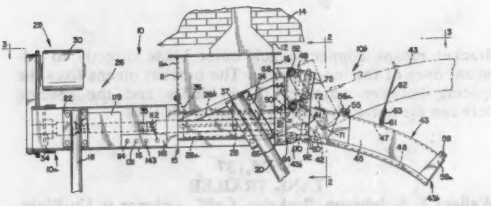
Filed June 16, 1969, Ser. No. 833,528
Int. Cl. B30b *15/08, 15/30*
U.S. Cl. 100—45 **5 Claims**



A screw force feeds waste to a swing-hammer rotor shredder. Waste processed by the shredder sifts through a

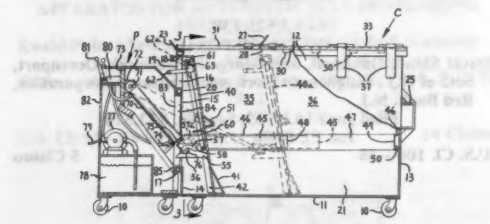
grate into a compaction chamber. A first compaction ram compresses the waste by pressing down on it at an angle of about 30°, and a second compaction ram further compresses the waste by pressing horizontally on it. A gate opens and the compressed waste is extruded. Sensors and a control circuit coordinate the various functions and automatically start and stop the apparatus under certain conditions.

3,625,139
REFUSE PACKING ASSEMBLY FOR BUILDINGS AND THE LIKE
Cyril R. Golinick, Oshkosh, Wis., assignor to Leach Company, Oshkosh, Wis.
Filed Sept. 29, 1969, Ser. No. 861,663
Int. Cl. B30b *1/18, 15/14, 15/32*
U.S. Cl. 100—49 **9 Claims**



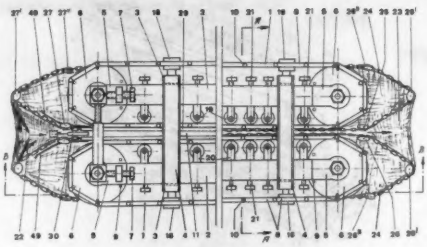
A hopper of a refuse packing assembly is positioned to receive refuse material from a refuse chute of a building. A ram is positioned in the hopper for movement transversely of the path traveled by refuse material as it falls into the hopper whereby movement of the ram into engagement with the refuse material will result in compaction of the refuse material between a front face of the ram and a yieldable panel member. An electrical control system automatically energizes the drive for the ram when a predetermined amount of refuse material has been received in the hopper.

3,625,140
PORTABLE REFUSE PACKER
Richard G. Glanz, 3038 N.E. 139th Ave., Portland, Oreg.
Filed June 18, 1970, Ser. No. 47,300
Int. Cl. B30b *15/06*
U.S. Cl. 100—100 **20 Claims**



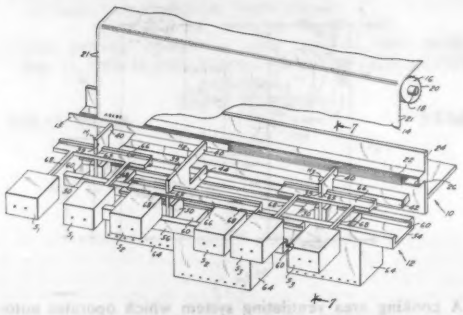
A wheeled container having a pair of hinged lids has a packer plate mounted for sliding movement within the container. A wheeled power unit has a hydraulic cylinder with a piston rod arranged for detachable connection with the packer plate in the container. Refuse deposited in the container is crushed and compressed to a small volume by the packer plate and when the container is full the power unit is connected to an empty container. Then the filled container is wheeled to a loading area for garbage trucks and its contents dumped into a truck. Thus, the packer is brought to the refuse instead of following the conventional practice of transporting the refuse to the packer.

3,625,141
CONTINUOUS EXTRACTION PRESS
Oskar Braun, Bensheim, Bergstrasse, Germany, assignor to Josef Willmes KG, Bensheim Bergstr., Germany
Filed Feb. 12, 1969, Ser. No. 798,758
Claims priority, application Germany, Feb. 16, 1968, P 16 27 981.5
Int. Cl. B30b *9/24*
U.S. Cl. 100—119 **14 Claims**



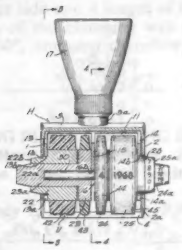
Two conveyors form therebetween a pressure zone which tapers in the common direction of conveyor movement. At least one of the conveyor belts consists of hingedly connected plates which are backed by a row of rollers spaced more closely than the length of each conveyor plate. The material to be extracted is fed into the pressure zone in a continuous loop of a porous web folded into a U-channel while in the pressure zone.

3,625,142
HIGH-SPEED PRINTING APPARATUS HAVING SLIDABLY MOUNTED CHARACTER-FORMING ELEMENTS FORMING A DOT MATRIX
Aaron D. Bresler, Merrick, N.Y., assignor to Datascript Terminal Equipment Corp., Lindenhurst, N.Y.
Filed June 10, 1970, Ser. No. 45,008
Int. Cl. B41j *1/16*
U.S. Cl. 101—93 C **47 Claims**



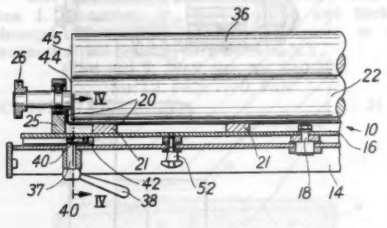
A high-speed printer apparatus characterized by a font assembly having a plurality of slidably mounted character-forming elements forming a dot matrix. The dot projections are so arranged on said elements that any given character may be formed on said matrix at any given character position by small linear relative movements of such elements. Hammer means are mounted opposite the font assembly and are movable to said character positions and actuated to press the character image onto the paper by means of a ribbon. Logic means are provided to control the position of the character-forming elements and hammer means and the sequence of operation, all in response to data input signals.

3,625,143
MARKING DEVICE
Raphael D. Nettesheim, New Berlin, and Thomas J. Mohs, Madison, both of Wis., assignors to The Schwaab Label Company, Inc., Milwaukee, Wis.
Continuation of application Ser. No. 764,540, Oct. 2, 1968, now abandoned. This application Nov. 18, 1970, Ser. No. 90,768
Int. Cl. B41j 1/26, 27/20
U.S. Cl. 101—106 2 Claims



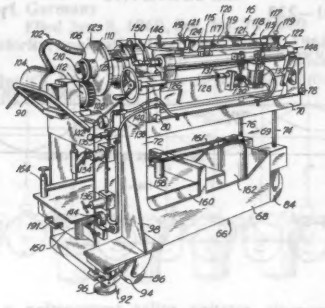
A marking device, such as a hand stamp, dater, coder or other printing device, and having a marking band of self-storing fluid material for marking articles with ink or other fluids. The band is formed as a sleeve of microporous synthetic resin and this resin band is bonded to an inner flexible and woven reinforcing material. The composite sleeve so formed is insertable over a supporting cylinder which fully supports the entire sleeve of said relatively fragile resin. A holder is provided for such a sleeve of microporous resin material, and the resin material and its supporting cylinders are shiftable in the holder between (1) an inoperative, protected position within the holder and (2) an operative position where it can contact the article to be marked.

3,625,144
SKEWING DEVICE FOR DAMPENER OF OFFSET PRINTING PRESS
Robert Reinartz, Augsburg, and Oskar Liebert, Westheim, both of Germany, assignors to Maschinenfabrik Augsburg-Nurnberg AG, Augsburg, Germany
Filed July 24, 1969, Ser. No. 844,387
Claims priority, application Germany, July 26, 1968, P 17 61 949.7
Int. Cl. B41l 25/02
U.S. Cl. 101—148 6 Claims



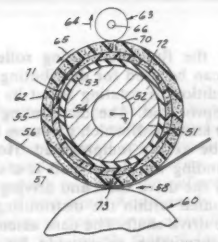
A wetting mechanism for transferring liquid from a supply roll which is immersed in a liquid reservoir to a lifting roll. The supply roll and the lifting roll are peripherally engaged. The axes of the rolls are in a common plane. The supply roll is mounted on a support plate and both are pivoted about a center pivot. The pivotal movement is caused by moving a lever which is connected to a cam which engages a camming surface on the support plate.

3,625,145
CYLINDER CART FOR EXCHANGING CYLINDERS ON THE FLY
William A. Heatley, Jr., Wayne; Joseph R. Caulfield, Norwood, and Alfons M. Schmid, East Orange, all of N.J., assignors to Bobst Champlain, Inc., Roseland, N.J.
Filed June 5, 1969, Ser. No. 830,697
Int. Cl. B41f 9/18
U.S. Cl. 101—152 33 Claims



A rotogravure printing press has a printing station frame defining a hollow space, and a detachable gravure carriage is movable into and out of the hollow space in the frame. The detachable printing carriage is an integral unit and carries a number of components which are employed in the printing operation. The carriage is provided with lower wheels for movement of the carriage along the ground when it is outside of the station. In addition, rollers are provided on the side of the carriage frame for carrying the carriage into the printing station to a position where the printing cylinder on the carriage engages the main drive mechanism in the printing station through coupling means. This can be accomplished "on the fly" with adjacent printing stations in operation. Means are also provided to engage the printing cylinder "in register." Additional features include an idling drive mechanism mounted on the gravure carriage for rotating the printing cylinder outside of the printing station and a complete inking system for off-press make-ready. With this mechanism the doctor blade which is also positioned on the carriage can be "run in" outside of the station. A unique connecting assembly partly positioned on the carriage and partly positioned in the printing station is provided for enabling the doctor blade to be joined with an oscillatory drive mechanism in the printing station.

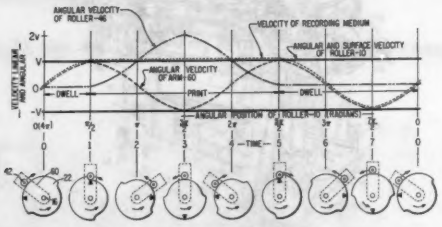
3,625,146
IMPRESSION ROLLER FOR CURRENT-ASSISTED PRINTING
Joel F. Hutchison, Danville, Ill., assignor to Hurletron Incorporated, Danville, Ill.
Filed June 2, 1969, Ser. No. 829,241
Int. Cl. B41f 9/00
U.S. Cl. 101—153 12 Claims



An impression roll comprising a core of metal which can be assumed to be grounded, an insulating layer, preferably of rubber, on the core, and a semiconductive layer preferably of

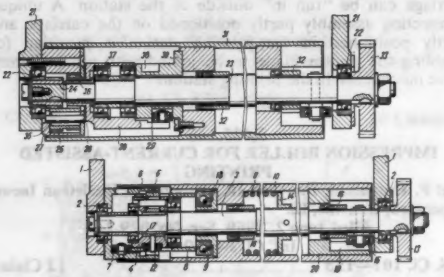
rubber providing the external surface but having a conductor internally thereof to provide a conductive path bypassing at least a substantial portion of the semiconductive layer.

3,625,147
APPARATUS FOR CONTACT PRINTING
Robert Aron Rubenstein, Framingham, Mass., assignor to RCA Corporation
Filed Oct. 8, 1969, Ser. No. 864,676
Int. Cl. B41f *5/10*
U.S. Cl. 101—223 **13 Claims**



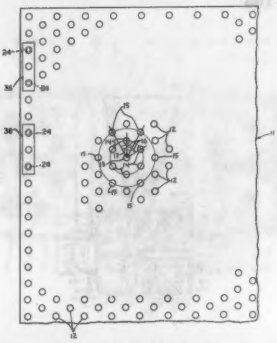
A continuously rotating roller transporting a printing master and an idler roller transporting a recording medium are engaged for printing transfer when the idler roller has zero angular velocity but is being driven about the surface of the continuously rotating roller at the latter's angular velocity. As there is no difference in surface speed between the printing master and recording medium at the area they make contact, smudging is prevented.

3,625,148
DEVICE FOR AXIALLY MOVING FLUID-DISTRIBUTING ROLLERS
Miloslav Muselik, Ricmanice, and Antonin Svoboda, Adamov, both of Czechoslovakia, assignors to Adamovske strojirny narodni podnik, Adamov, Czechoslovakia
Filed Aug. 25, 1969, Ser. No. 852,569
Int. Cl. B41f *1/46*; **F16h** *25/12*
U.S. Cl. 101—348 **5 Claims**



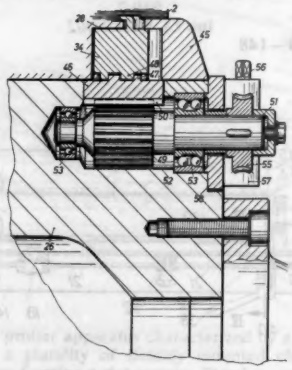
In a drive for the fluid-distributing roller of a printing press, the roller can be used for distributing either moisture or ink and, in addition to rotating about its axis, is required to be axially reciprocated. The distributing roller coaxially surrounds a drive shaft with which it rotates but with respect to which it can be axially reciprocated. Housed within the roller and surrounding the drive shaft is a step down transmission driven by the drive shaft and driving a cam assembly which is also situated within the distributing roller between the latter and the drive shaft. The cam assembly is driven by the stepdown transmission to provide for the distributing roller lateral movement cycles each of which includes axial movement first in one direction and then in the opposite direction. Each of the lateral movement cycles takes place during a time when the distributing roller and drive shaft both rotate through more than one revolution.

3,625,149
VARIABLE DESIGN PRINTING MEANS
Robert Moore Allen, 718 Knollwood St., Winston-Salem, N.C.
Filed Oct. 21, 1969, Ser. No. 868,153
Int. Cl. B41f *17/00*
U.S. Cl. 101—373 **9 Claims**



In abstract, a preferred embodiment of the present invention is a variable design block print consisting of a pegboard with pins or pegs for mounting the printing blocks thereon. The holes for receiving the pegs within the board are spacingly arranged in a uniform pattern of equilateral triangles. The blocks are of various shapes and contain multiple pin-receiving holes arranged in a predetermined pattern for mounting in different orientations and positions.

3,625,150
DEVICE FOR SECURING ARCUATE STEREOTYPE PRINTING PLATES ONTO A PLATE CYLINDER OF WEB-FED ROTARY PRINTING PRESSES
Hans-Bernhard Bolza-Schunemann, Wurzburg, and Heinrich Lichtblau, Karlstadt, both of Germany, assignors to Schnellpressenfabrik Koenig & Bauer Aktiengesellschaft, Wurzburg, Germany
Filed Oct. 14, 1969, Ser. No. 866,211
Claims priority, application Germany, June 11, 1969, P 19 29 604.4
Int. Cl. B41f *13/16, 27/06*
U.S. Cl. 101—378 **10 Claims**



The invention relates to a device for securing arcuate stereotype printing plates forming a part of a circle and being secured onto a plate cylinder of web-fed rotary printing presses by tensioning several pairs of viselike underside jaws actuating resiliently in an axial direction one against another and gripping into underside facets of the plate. The jaws are shaped like segments forming a part of a circle and corresponding to the length of curvature of the plate. The stereotype plates are positioned on supporting segments

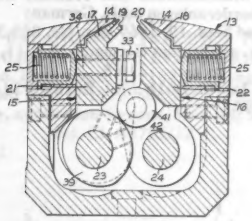
which are secured onto the body of the cylinder and correspond to the length of curvature of the plate. The jaws are provided with a thread on their respective underside. A threaded segment meshes with the thread of the jaw and has teeth on its underside which coact with a pinion being secured on an axle which is arranged parallel to the axis of the plate or form cylinder, the axle of which is driven by a worm gear. By actuating the worm gear the jaws are shifted and the printing plate is clamped. The worm of the worm gear is preloaded in the axial direction by cup springs bundled as a package. In order to clamp four plates on the circumference of the plate cylinder, the threaded jaw segment 34 has a radian length of 90° and the toothed segment 46 has a thread on its upper side and a length of 60° of radian measure, the maximum of the clamping way i.e. the difference between 90° and 60°, amounts therefore to 30° of radian measure.

3,625,151

PRINTING PLATE LOCKING DEVICE

Michael Leonard Hart, Northborough, Peterborough, England, assignor to Baker Perkins Limited, Peterborough, England

Filed July 7, 1969, Ser. No. 839,532
Int. Cl. B41f *27/12*
U.S. Cl. 101—415.1 **8 Claims**



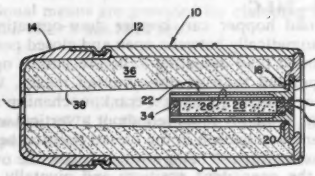
Device for locking a printing plate onto a cylinder of a rotary press which enables the plate to be mounted and tensioned in register for operative rotation of the cylinder in either direction. A pair of grippers, each having a head for engagement with a respective opposite end portion of a plate wrapped around the cylinder, are mounted in a carrier transversely of the cylinder periphery and are each resiliently urged for independent plate-tensioning movement. Adjustment means is engageable alternatively with whichever gripper is to locate the operatively leading end portion of the plate to prevent said movement thereof so as to establish the register of the plate, while leaving the other gripper free to move for tensioning it.

3,625,152

IMPACT-ACTUATED PROJECTILE FUZE

Clayton J. Schneider, Jr., East Aurora, and Richard E. Reinnagel, Elma, both of N.Y., assignors to Cornell Aeronautical Laboratory, Inc., Buffalo, N.Y.

Filed July 9, 1969, Ser. No. 840,292
Int. Cl. F42c *1/10, 9/00*
U.S. Cl. 102—73 **21 Claims**



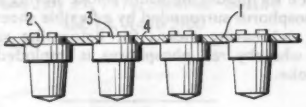
A projectile housing. A body of pyrotechnic material in the housing. A fuze container fixed to the base end of the housing. A burning fuze material in the fuze container, the container fabricated of a material that looses its structural integrity in response to the heat of the fuze flame front, whereby upon impact of the projectile that container separates exposing the burning fuze to the body of pyrotechnic material.

3,625,153

PROPELLANT CARTRIDGE CARRYING BAND FOR COMMERCIAL DEVICES

Heinz Gawlick, Furth, and Hans Umbach, Stadeln, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Filed Jan. 8, 1969, Ser. No. 789,860
Claims priority, application Germany, June 9, 1968, P 16 78 199.0
Int. Cl. C06c *7/02;* F42c *19/10;* C06d *1/04*
U.S. Cl. 102—86.5 **8 Claims**



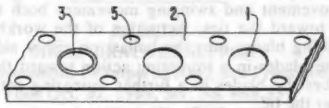
A plurality of propellant cartridges are serially connected with each other to form a band that may be rolled up for utilization in a commercial device, such as a riveting gun. The cartridges may be attached to a band by extending their electrical leads through the band for clamping the cartridges to the band, bonding the cartridges to the band, or providing the cartridges with a force fit in recesses of the band, for example. Also, propellant carrying cases may be formed in pairs for serial connection with primer carrying bases formed in pairs. Also, preformed lengths of cartridge-carrying bands may be connected serially with each other by means of connectors.

3,625,154

MAGAZINE FOR PROPELLANT CHARGES WITHOUT CARTRIDGES

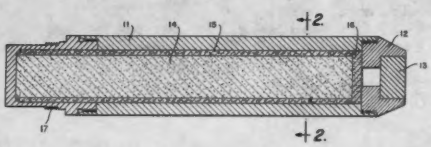
Heinz Gawlick, Furth; Gunther Marondel, Erlangen, and Hellmut Bendler, Nurnberg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Traisdorf, Germany

Filed Feb. 11, 1969, Ser. No. 798,291
Claims priority, application Germany, Feb. 21, 1968, P 16 78 202.8
Int. Cl. F42b *39/12*
U.S. Cl. 102—86.5 **10 Claims**



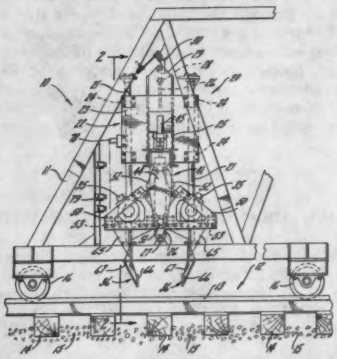
A magazine for caseless propellant charges which are entirely consumed leaving no residue after burning, for use in both military and commercial applications, including an extended flexible band having a plurality of recesses, each adapted for receiving a single propellant charge, spaced along the length of said band. Additionally, the band may incorporate a plurality of depressions, apertures and/or projections spaced along the length thereof for indexing of the magazine relative to the activating device. Further, a readily detachable foil may be secured adhesively along one or both major surfaces of the band to retain the propellant charges with the respective recesses and simultaneously shield them from heat which could cause accidental detonation.

3,625,155
DEVICE FOR PRODUCING WHITE SMOKE BY IMPLODING RED PHOSPHORUS
Bernard E. Douda, Bloomfield, Ind., and Roscoe D. Dwiggins, Derwyn Heights, Md., assignors to The United States of America as represented by the Secretary of the Navy
Filed Jan. 8, 1970, Ser. No. 1,500
Int. Cl. F42b 13/44
U.S. Cl. 102—90 3 Claims



A device for producing white smoke having an inner core of red phosphorus surrounded by a flexible sheet of explosive material and having means for detonating said explosive material whereby red phosphorus is imploded to produce white smoke.

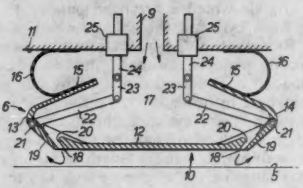
3,625,156
BALLAST TAMPING WORKHEAD
James E. Anderson, Ludington, Mich., assignor to Jackson Vibrators, Inc., Ludington, Mich.
Filed Sept. 5, 1969, Ser. No. 855,579
Int. Cl. E01b 27/16
U.S. Cl. 104—12 6 Claims



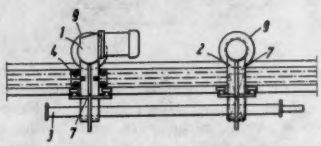
A ballast tamping workhead having tamping blades rigidly fixed to high-frequency vibratory motors that are carried, through compression-loaded insulating mountings, for up and down movement and swinging movement both toward the rail and toward the ties. Actuation of the workhead drives the vibrating blades into the ballast on either side of a tie, forces the blades in a squeezing action toward the rail, and then forces the blades in a further squeezing action toward and under the tie.

3,625,157
GAS CUSHION LOAD-SUPPORTING DEVICE
William Barrie Hart, Burwell, England, assignor to Tracked Hovercraft Limited, London, England
Filed June 23, 1969, Ser. No. 835,581
Claims priority, application Great Britain, June 24, 1968, 29,983/68
Int. Cl. B60v 1/04, 1/16
U.S. Cl. 104—23 FS 10 Claims

A gas cushion load-supporting device, particularly useful for a tracked gas cushion vehicle, has a member with a nozzle for forming a peripheral jet for containing a gas cushion. This cushion member is movable with respect to a load-supporting structure. The nozzle has a movable wall which is connected to the supporting structure through a linkage so that movement of the cushion member towards the structure opens the nozzle thus increasing the jet thickness. The results in the height of the cushion member above the track remaining more nearly constant.



3,625,158
TROLLEY FOR OVERHEAD MONORAIL CONVEYOR
Klaus Lorenz; Horst Giessler; Friedrich Juergens, Whylen/Baden, Germany; Marc Waelti, Luzern, Switzerland; Adolf Mutter, and Adolf Steinbock, Whylen/Baden, Germany, assignors to Firma Rene Blaser Hebe-und Foerderanlagen, Maschinenbou and Translift Gesellschaft fuer Hebe-und Foerderanlagen mbH. Germany
Filed Sept. 19, 1969, Ser. No. 859,356
Claims priority, application Germany, Nov. 11, 1968, P 18 08 210.5
Int. Cl. B61b 3/00; E01b 25/24
U.S. Cl. 104—93 5 Claims

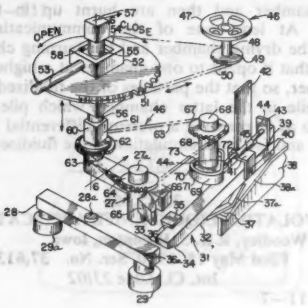


An overhead trolley system using a special-profile monorail structure with horizontal curve sections, where the trolley assembly consists of a drive unit and an idler unit, connected by a traverse. The two units have similar C-frames, a support and guide wheel on top, and lateral guide rollers at the bottom. The wheel of the drive unit is driven by a motor and worm gear, and the power is transmitted over a roller-supported collector from rail-mounted bus bars. The traverse includes a yoke and a runup switch.

3,625,159
MANUALLY OR AUTOMATICALLY ACTUATED CLOSURE OPERATING MECHANISM LOCK
Charles R. Radey, Michigan City, Ind., and James J. Schuller, Dolton, Ill., assignors to Pullman Incorporated, Chicago, Ill.
Filed July 2, 1969, Ser. No. 838,713
Int. Cl. B61d 7/18, 7/26, 7/30
U.S. Cl. 105—241 C 4 Claims

In a railroad hopper car, hopper door-operating means operable automatically between open and closed positions by ground-mounted door-actuating structure and/or opened by manually operated railroad car-mounted means, the door-operating mechanism including a crank mechanism and drive lever therefor rotatably mounted about a vertical axis of the car, said crank mechanism in the closed position being overcenter against a stop and being swingable past the overcenter position to the open door position, and pivotally mounted auxiliary lock bar means automatically positionable from an elevated out-of-way position to a horizontal position obstructing movement of the crank mechanism past the overcenter position, and vice versa with manual means for raising the lock bar to the inoperative position and lowering the

same to the operative position, said manual means including a handwheel and gear means operable upon a cam element



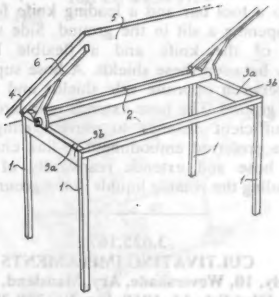
engageable with a push rod for pivoting the lock bar between raised inoperative and lowered operative positions.

3,625,160

SYSTEM FOR BALANCING A TABLETOP THAT MAY BE ADJUSTABLY SET IN POSITION

Per G. Bergman, Hyggevagen 21, 163 54 Spanga, Sweden

Filed Mar. 6, 1970, Ser. No. 17,052
Claims priority, application Sweden, Mar. 14, 1969, 3551/69
Int. Cl. A47f *5/12*
U.S. Cl. 108—2 **3 Claims**



A torsion spring system for balancing a tiltable tabletop so that it will be retained in any rotative position to which it is set. One or more torsion spring elements are nonrotatively positioned in a rotatable tube carrying two arms for engaging the lower side of the tabletop. Means are provided for locking the torsion spring elements and the rotatable tube into definite rotative positions with respect to each other, and additional means are provided for clamping the tabletop into position after it has been set.

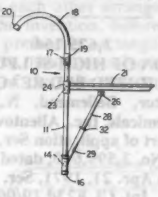
3,625,161

FOLDING TRAY

Bette J. Rosner, 6777 E. Pleasant Run Parkway, South Drive, Indianapolis, Ind.

Filed Dec. 8, 1969, Ser. No. 882,963
Int. Cl. A47b *23/00*
U.S. Cl. 108—44 **1 Claim**

Folding tray for use in conjunction with the seat of an automobile. The tray is supported by a pair of leg portions that terminate in hooks which engage the back of an automobile seat. The hooks swivel between extended, use position and retracted, storing position. They are also movable laterally to span the space between two bucket-type seats. The tray is



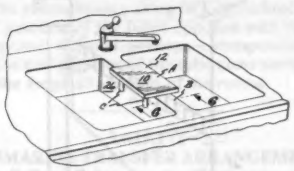
supported by a single brace and is readily adjustable to varying heights.

3,625,162

SINK DIVIDER SUPPORTED UTILITY BOARD

Beatrice L. Crew, 5120 Abbott Road, South Gate, Calif.

Filed July 21, 1970, Ser. No. 66,157
Int. Cl. A47b *5/00*
U.S. Cl. 108—47 **4 Claims**



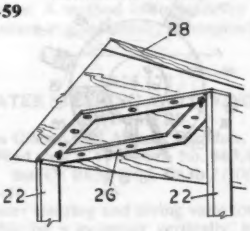
A flat rigid rectangular member having a first work-supporting surface and second surface oppositely disposed therefrom, which second surface has a number of diagonally positioned slots of T-shaped transverse cross section extending inwardly into said member therefrom, with said slots intersecting at a central opening, and each of said slots slidably supporting a nut in a nonrotatable position within the confines thereof. Four legs are provided that have threaded studs extending upwardly therefrom which studs are insertable in said slots, and by rotation of said legs engaging said nuts. By rotation of the legs relative to the nuts, the legs may be forced into friction gripping contact with said second surface to so position the legs that said member may be removably mounted on the divider of a sink to provide a work surface for such kitchen chores as slicing fruit, cleaning pots and pans and the like. By removing the device from the divider and placing it in an inverted position, the free ends of the legs provide a convenient means supporting a hot pan or skillet in a location adjacent a stove, but without danger of the heated utensil defacing or burning the surface on which the device rests.

3,625,163

SHELF BRACKET SUPPORT

Arnold A. Grossman, 14 Imperial Ave., San Francisco, Calif.

Filed Oct. 22, 1969, Ser. No. 868,359
Int. Cl. A47b *47/02*
U.S. Cl. 108—59 **1 Claim**



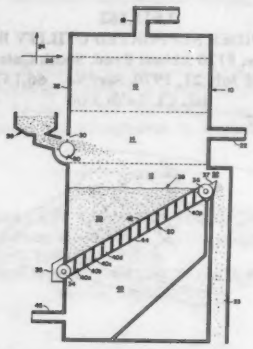
A rigid support bracket for assembling a tier of shelves comprised of a generally rectangular-shaped member with

means on an upper portion for securing the bracket to the underside of a shelf.

3,625,164
COMBUSTION OF HIGH-SULFUR COAL IN A FLUIDIZED BED REACTOR

Marshall L. Spector, Bellemead, N.J., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of application Ser. No. 60,379, Aug. 3, 1970, now Patent No. 3,599,610, dated Aug. 17, 1971. This application Apr. 21, 1971, Ser. No. 135,981
Int. Cl. F23d *19/00*
U.S. Cl. 110—1 J **10 Claims**

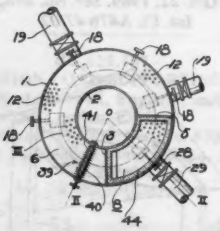


Heating values are recovered from sulfur-containing coal in a reactor which includes a gasification zone, a combustion zone and a heat recovery zone. A fluidized bed of coal and limestone is maintained within the gasification zone, which is supported by a moving foraminous grate. Primary air, which is also the fluidizing medium, enters the gasification zone through the grate. The zone is operated adiabatically, under reducing conditions, to yield CaS and an effluent rich in CO. The CaS is discharged from the gasification zone by the moving grate and the gaseous effluent, containing entrained desulfurized coal fines, enters the combustion zone where secondary air is added. The exotherm of combustion is retrieved in the heat recovery zone, using conventional techniques. The flue gas from the reactor contains little sulfur dioxide to pollute the environment. The CaS may be processed in several ways to recover elemental sulfur.

3,625,165
A BURNING APPARATUS

Eiichi Ishigaki, Sakaide, Japan, assignor to Ishigaki Kiko Co., Ltd.

Filed Feb. 24, 1970, Ser. No. 013,489
Int. Cl. F23g *5/04*
U.S. Cl. 110—7 R **6 Claims**

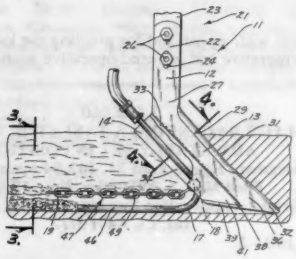


A burning apparatus for wet substances to be burnt up such as dewatered slurry from a filtering apparatus wherein a fluidized bed of particles unable to be burnt is formed in a series or several series of drying chamber and burning chamber or these two chambers and heating chamber therebetween, said fluidized bed is circulated continuously through said chambers in a direction from the drying chamber toward the burning chamber, and powder or particlelike substances to be burnt up are fed into the drying chamber and are carried with said fluidized bed so that the substances are dried in the drying chamber and then are burnt up in the burning chamber. At least one of the communicating passages between the drying chamber and the burning chamber is so designed that it opens to one chamber at a higher level then to the other, so that the particles of the fluidized bed form a particle pile in the latter chamber, which pile closes said passage so as to preserve a pressure differential between the chambers and facilitate circulation of the fluidized bed.

3,625,166
VOLATILE LIQUID KNIFE APPLICATOR

Morris I. Woodley, R.R. 3, Hampton, Iowa

Filed May 15, 1970, Ser. No. 37,613
Int. Cl. A01c *23/02*
U.S. Cl. 111—7 **7 Claims**

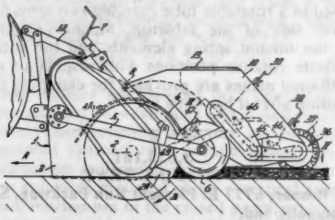


A knife applicator for applying volatile liquids to the soil is provided herein. The knife applicator is comprised of a shank securable to a tool bar and a leading knife formed on the shank for opening a slit in the ground. Side shields extend rearwardly of the knife and a flexible hose extends downwardly between these shields. A hose support member is affixed between opposite side shields and maintains the hose in the ground. The hose extends rearwardly of the side shields a sufficient distance to prevent icing of the side shields. In a preferred embodiment, a link chain is secured above the hose and extends rearwardly of the hose to facilitate sealing the volatile liquids in the ground.

3,625,167
CULTIVATING IMPLEMENTS

Van Der Lely, 10, Weverskade, Ary, Maasland, Netherlands

Filed Feb. 11, 1969, Ser. No. 798,283
Claims priority, application Netherlands, Feb. 16, 1969, 6802209
Int. Cl. A01c *5/00*; A01b *33/00*
U.S. Cl. 111—87 **6 Claims**



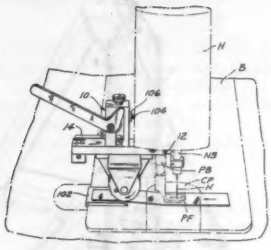
This invention relates to cultivating implements or cultivators of the kind comprising a movable frame, a rotary shaft supported by the frame, soil-working members mounted on said shaft and a hood that partially surrounds said shaft and soil-working members in such a way that one edge thereof contacts, or is in close proximity to, the ground surface during a cultivating operation.

3,625,168

WORKPIECE PULLER ADAPTED FOR ATTACHMENT TO THE NEEDLE BAR OF A SEWING MACHINE

Louis Palazzo, 124 Meridian Road, Levittown, N.Y.

Filed Nov. 28, 1969, Ser. No. 880,539
Int. Cl. D05b *27/14*
U.S. Cl. 112—211 **10 Claims**



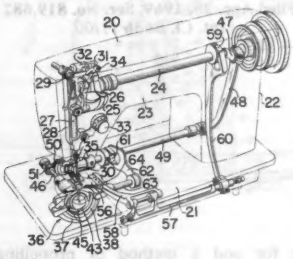
Roller means adapted to pull a length of goods in a stepwise manner is mounted on the presser bar of a sewing machine and is angularly displaced in response to the movement of the sewing machine needle bar in both directions of the movement thereof. Clutch means control the movement of the roller means.

3,625,169

CHAIN-STITCH-FORMING DEVICE FOR LOCK-STITCH SEWING MACHINES

Chikao Yamashita, Aichi-ken, and Koji Nishiyama, Osaka-shi, both of Japan, assignors to Brothers Kogyo Kabushiki Kaisha, Mizuho-ku, Nagoya-shi, Japan

Filed Oct. 20, 1969, Ser. No. 867,721
Claims priority, application Japan, Sept. 1, 1969, 44/69157
Int. Cl. D05b *1/14*
U.S. Cl. 112—168 **13 Claims**



A chain-stitch-forming member is fitted into the loop of a lock-stitch sewing machine in place of the usual bobbin case. The chain-stitch-forming insert member has a loop retaining projection for retaining a loop in cooperation with a needle of the machine and a cam mechanism between the loop taker and the projection to effect the prescribed movement of the projection to form chain-stitches as the machine operates.

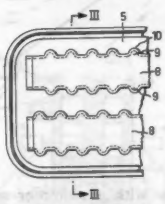
3,625,170

PROCESS OF MAKING HOLES IN A PLATE TO BE USED IN A HEAT EXCHANGER

Rolv Gunnar Josok, Olofstrom, Sweden, assignor to Olofstrom AB, Olofstrom, Sweden

Filed Nov. 28, 1969, Ser. No. 880,568
Claims priority, application Sweden, Dec. 3, 1968, 16479/68
Int. Cl. B21d *53/04*
U.S. Cl. 113—118 C **1 Claim**

This invention is concerned with a process of making holes with a surrounding collar by a combined punching and drawing operation, hereinafter called "draw-punching," in the so called end plates of a heat exchanger for inserting the tubes of heat exchangers of the type comprising distributing and collecting vessels i.e. headers for a heat exchanging medium and rows of tubes of flattened cross section with their flat sides turned towards each other arranged between said vessels. According to the invention, before draw-punching the holes, an elongated, preferably rectangular recess is pressed for each row of tubes, the recess having a length at least equal to the length of the tube row, a width less than the



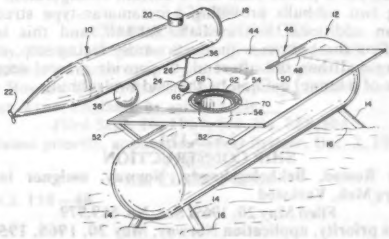
length of the tube cross section and a depth approximately equal to the height of the collar formed around the edge of each hole, the recess having along its longitudinal sides at the locations of junction of the tubes opposite with the end plate pairwise opposed widened portions corresponding in shape and size to the end portions of the tube cross sections extending outside the longitudinal sides of the recess.

3,625,171

SUBMARINE TRANSFER ARRANGEMENT

Vincent R. Bailey, Palm Beach, Fla., assignor to Perry Oceanographics, Inc., Riviera Beach, Fla.

Filed Sept. 5, 1969, Ser. No. 855,594
Int. Cl. B63g *8/00, 8/24*
U.S. Cl. 114—16 R **13 Claims**



A transfer submarine and a submerged structure are constructed to facilitate transfer of personnel. The submarine is provided with a tethered ball at the end of a cable, and the submerged structure has a capture platform which has a slot for receiving the cable and restraining the submarine so as to facilitate alignment of a depending chamber of the submarine and an upstanding chamber of the submerged structure. The depending chamber has a spherical outer surface and the upstanding chamber has a mating conical surface for forming a transfer chamber. A method is disclosed by virtue of which the transfer occurs at substantially atmospheric pressure.

3,625,172

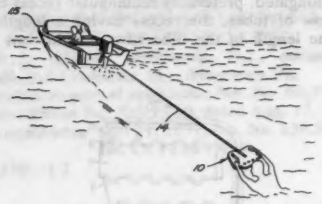
UNDERWATER STEERING AND DIVING VANE FOR SWIMMERS

William James Gilster, 249 Albany, Ferndale, Mich.

Filed Oct. 3, 1969, Ser. No. 863,485
Int. Cl. B63g *8/00;* **B63b** *21/00*
U.S. Cl. 114—16 **5 Claims**

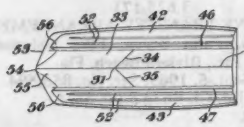
An underwater steering and diving vane towable by a boat and controllable by a swimmer vertically, horizontally and obliquely having a substantially central towline attachment and at least one handle lying rearwardly of the towline attachment which in conjunction with the water resistance drag of the swimmer, the universal pivot point of the attachment,

and the location of the handle substantially equalizes forces imposed on the vane leaving the vane substantially force-



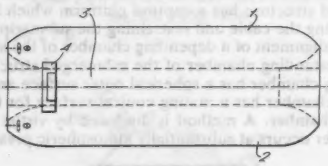
equalized under tow with a swimmer so that the swimmer may steer the vane as desired with minimal steering effort.

3,625,173
HULLS FOR POWER BOATS
Les Mitton, 9, Parkland View, Hinstock Road, Birmingham, 20, England
Filed Aug. 8, 1969, Ser. No. 848,593
Int. Cl. B63b *1/10*
U.S. Cl. 114—61 **3 Claims**



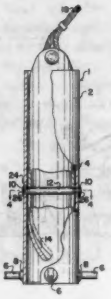
A hull for a power boat has a bottom configuration comprising two subhulls providing a catamaran-type structure, with an additional intermediate subhull, and this last is formed on the bottom with a rearwardly facing step, nearer the fore-end than the afterend, to provide a local sectional change of a tunnel defined by the said two subhulls.

3,625,174
SHIP CONSTRUCTION
Bjarne Rosted, Bekkelagshogda, Norway, assignor to A/S Akers Mek, Verksted
Filed May 20, 1969, Ser. No. 869,979
Claims priority, application Norway, May 20, 1968, 1957/68
Int. Cl. B63b *3/02*
U.S. Cl. 114—77 R **2 Claims**



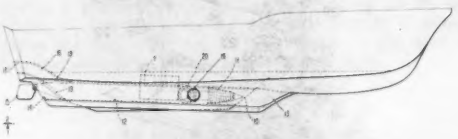
A large capacity ship is constructed by joining three smaller vessels, two of which include independent propulsion and navigation means and each having an asymmetrical cross section. The third vessel has less draft than the other two and lies between the two other vessels and is joined thereto so that its hull lies above the waterline. The nonsymmetrical sides of the two vessels are placed in opposing relationship to one another so that the sea-going characteristics of the combined vessel are improved.

3,625,175
RECOVERABLE BOAT ANCHOR
Laverne E. Mangel, 4713 Florist, Wichita Falls, Tex.
Filed Feb. 20, 1970, Ser. No. 12,927
Int. Cl. B63b *21/34*
U.S. Cl. 114—207 **5 Claims**



A tubular boat anchor with inner and outer shank portions, one of which portions has multiple flukes thereon. The anchor portions may be rotated relative to each other so as to normally free the boat anchor, one shank portion of which has a slot formed therein, which slot may be inclined or spiral with an interengaging pin passing through the slot and being secured to the other of the shank portions. Provision is made for the interengaging pin to be a shear pin, which is circumferentially scored at the point of shear, to pass through the slot, which pin will shear upon predetermined impact, to enable recovery of the anchor line and one of the shank portions of the anchor.

3,625,176
HYDROJET PROPULSION OF BOATS
Karl Moellering, 77 Forest Drive, Pompton Plains, N.J.
Filed Apr. 28, 1969, Ser. No. 819,682
Int. Cl. B63h *11/00*
U.S. Cl. 115—12 R **9 Claims**

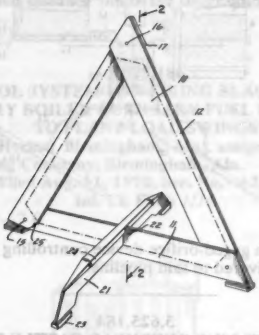


A system for and a method of propelling boats by hydrojets. The illustrative embodiment employs a single engine driving a pump provided with a central water inlet and with two longitudinally extending discharge conduits which are equally spaced on opposite sides of the centerline of the boat. The rear, discharge ends of the conduits are disposed below the waterline when the boat is at rest. Connected to the conduits adjacent their rear ends by selectively operated valves are upper branch conduits which provide jets for driving the boat when it is planing and the discharge ports of the branch conduits are then under water. The boat is also provided with jet means for reversing the boat and for maneuvering it at slow speeds, as during docking.

3,625,177
PORTABLE EMERGENCY WARNING APPARATUS
Adam C. Miller, P.O. Box 1488, 1712 West McKinley, Phoenix, Ariz.
Filed Aug. 10, 1970, Ser. No. 62,409
Int. Cl. E01f *9/10*
U.S. Cl. 116—63 **1 Claim**

A portable emergency warning apparatus is provided having a foldable triangular-shaped warning portion in which one side of the triangle has pads thereon to act as a portion of the base and a removable base member having a pair of

feet attached between the ends of the side having pads thereon, whereby the base can be easily removed and the triangular portion folded for easy storage of the warning device. The base may be weighted and may have feet that are serrated to resist movement by wind being applied against the triangle and has means for steadying the triangular portion when assembled, and for locating the sides in a desired position when folded.

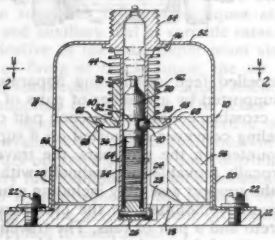


3,625,178

BIDIRECTIONAL SENSOR

Otakar P. Prachar, Santa Barbara, Calif., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 24, 1970, Ser. No. 66,463
Int. Cl. G01d *21/00*
U.S. Cl. 116—114 **3 Claims**



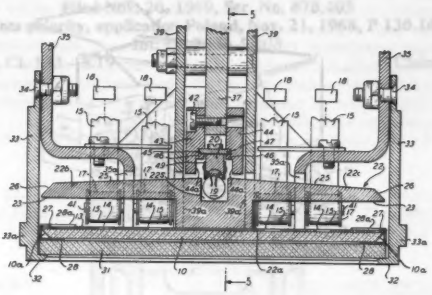
A support has a hollow tubular axial guide mounted on an end wall thereof. An operator is slidably mounted within the guide and spring biased in one axial direction or from normal unactuated position toward actuated position. Balls mounted within openings in the guide wall engage an annular shoulder of the operator to hold the operator in normal position. The balls are held in engagement with the operator shoulder by a cylindrical release member slidably mounted on the outer surface of the guide and spring biased oppositely of the operator and into engagement with the balls. A pair of seismic masses are pivoted to the support for swinging movement radially of the guide about axes located generally parallel of the guide axis. The masses are spring biased apart with respect to each other and radially outwardly of the guide into engagement with sidewalls of the support. Each mass includes a tapered elongated surface normally positioned in adjacent spaced relationship to a conical surface on a flange of the release member. Upon receipt of an acceleration pulse of predetermined amplitude and time directed generally radially of the guide, one of the masses moves radially toward the guide and the camming engagement of the tapered mass surface with the conical surface of the release member moves the release member axially of the guide to release the balls and in turn release the operator.

3,625,179

INDIRECTLY LIGHTED VERTICAL SCALE INDICATOR INSTRUMENT

William W. Allen, Jr., Plantation, and Edward T. Lovasz, Fort Lauderdale, both of Fla., assignors to McGraw-Edison Company, Elgin, Ill.

Filed Mar. 17, 1970, Ser. No. 20,358
Int. Cl. G09f *9/00*
U.S. Cl. 116—124 **8 Claims**



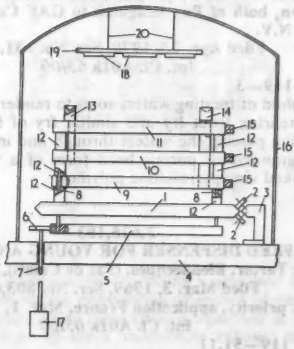
An indicator instrument has a transparent dial with horizontal indicia lines printed on the back side and with a masking plate covering the back side having vertical slots running past the indicia lines. Indicator tapes of translucent material at the back of the dial are moved vertically along the slots to indicate variations in variable quantities relative to the indicia lines. The dial is edge-lighted and the tapes are transilluminated by a lighting system including a light source and a plastic light diffuser plate.

3,625,180

EVAPORATION SOURCES

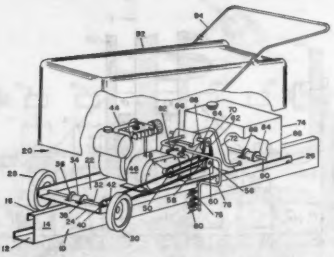
Stanley Desmond Smith, Reading, and Frederick Stafford Ritchie, Newcastle upon Tyne, both of England, assignors to Sir Howard Grubb Parsons & Company Limited, Newcastle upon Tyne, England, by said Ritchie

Filed Sept. 16, 1969, Ser. No. 858,304
Claims priority, application Great Britain, Dec. 2, 1968, 57,052/68
Int. Cl. C23c *11/00*
U.S. Cl. 118—48 **3 Claims**



An evaporation device for depositing thin films of material in high vacua which includes means for supporting a substrate material on which the films are to be deposited, and a rotatable evaporation source.

3,625,181
APPARATUS FOR CLEANING AND OILING PAVING FORMS
Arthur J. Weaver, 745 N. 57th Ave., Omaha, Nebr.
Filed Oct. 27, 1969, Ser. No. 869,829
Int. Cl. B05c *11/00*
U.S. Cl. 118—72 **8 Claims**



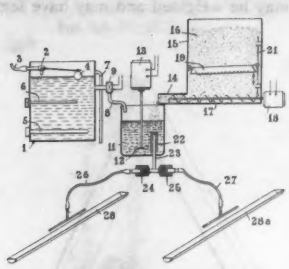
An apparatus for cleaning and oiling elongated paving forms which have a flat upper end. The apparatus includes a portable frame means having front and rear guide rollers adapted to roll along the upper end of the form. A power means is provided on the frame means and drives one of the guide rollers to propel the apparatus along the length of the form. A cleaning means is mounted on the frame means and is powered by the power means to clean the upper end of the form and the upper end of the vertical base portion of the form as the apparatus is moved along the length of the form. A powered spray means is mounted on the frame means and sprays oil on the form as the apparatus is propelled along the form. One embodiment of the cleaning means includes a rotatable member having a plurality of finger elements extending therefrom which are adapted to strike the form to remove foreign material such as concrete or the like therefrom. A modification of the cleaning means is disclosed wherein a plurality of spring loaded chisels or the like are operated by the power means to remove the foreign material from the upper end of the form.

3,625,182
TREATMENT OF WATER IN FISH HATCHERY REARING PONDS
Earl Pierce Williams, Pen Argyl, and Nathan David Field, Allentown, both of Pa., assignors to GAF Corporation, New York, N.Y.
Filed Apr. 23, 1970, Ser. No. 31,378
Int. Cl. A01k *63/00*
U.S. Cl. 119—3 **4 Claims**

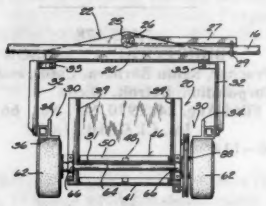
A method of treating waters so as to render the same suitable for rearing trout fry and similar fry of fresh water fish comprising passing the waters through and in contact with a porous granular or porous bead form of a water-insoluble, cross-linked vinylpyrrolidone polymer.

3,625,183
FEED DISPENSER FOR YOUNG ANIMALS
Adolphe Tartar, Blendecques, (Pas de Calais), France
Filed Mar. 3, 1969, Ser. No. 803,671
Claims priority, application France, Mar. 1, 1968, 142,045
Int. Cl. A01k *05/00*
U.S. Cl. 119—51.11 **7 Claims**

An apparatus for dispensing artificial food to young animals, which comprises a mixing vessel in which predetermined amounts of warm water and nutritive powder are delivered from a warm-water tank and a powder storage hopper, respectively, characterized in that the outlet of the mixing vessel is connected in parallel to separate troughs in which animals divided into groups requiring different food supplies can feed themselves, and that each supply line connecting said outlet of said mixing vessel to a trough has inserted therein a gaged-orifice device controlling the output of liquid food delivered to said pipeline.

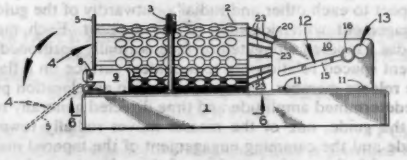


3,625,184
STRAIGHT LINE OVERHEAD CATTLE FEEDER
Paul Patz, Pound, Wis., assignor to Patz Company, Pound, Wis.
Filed May 18, 1970, Ser. No. 38,095
Int. Cl. A01k *05/00*
U.S. Cl. 119—52 B **21 Claims**



A self-propelled feed distributing apparatus including a feed bunk supported by a number of pairs of vertical frame members, a crossbar connected to each pair of frame members, a traveling conveyor supported on a support assembly pivotally mounted on the crossbars, the traveling conveyor being reciprocally movable longitudinally with respect to the feed bunk, the support assembly including a number of cross members pivotally mounted on the crossbars and movable relative thereto and a pair of rails. The traveling conveyor is driven by a pair of drive wheels operably positioned to engage the rails and is formed by a number of hingedly interconnected sections. A raddle conveyor is provided within the traveling conveyor to move feed, grain or silage within the traveling conveyor in the same direction as the direction of movement of the traveling conveyor with respect to the feed bunk.

3,625,185
ADJUSTABLE DEVICE FOR LIMITING THE MOVEMENT OF LABORATORY ANIMALS
Arthur S. Kester, Chicago, Ill., assignor to Rauland-Borg Corporation, Chicago, Ill.
Filed May 28, 1970, Ser. No. 41,196
Int. Cl. A61d *3/00*
U.S. Cl. 119—98 **6 Claims**



An adjustable device for retaining and limiting the movement of each of a number of small laboratory animals of dif-

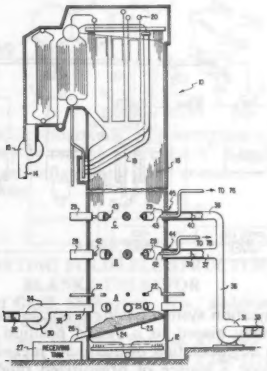
ferent size by confinement in a cylindrical cage of adjustable diameter having a gate means providing a closure for one end thereof and a variable closure for the opposite end of the cage, for adjustment of the distance to the gate. The adjustment of the diameter of the cylinder in close proximity to the animal prevents the animal from turning, and the adjustment of the internal distance limits the longitudinal movement of the animal.

3,625,186

CONTROL SYSTEM FOR FIRING BLACK LIQUOR RECOVERY BOILER AUXILIARY FUEL IN RESPONSE TO PLANT LOAD SWINGS

Roy Roger Herbst, Birmingham, Ala., assignor to The Rust Engineering Company, Birmingham, Ala.

Filed Aug. 11, 1970, Ser. No. 62,815
Int. Cl. F22b *1/18*
U.S. Cl. 122—7 C **12 Claims**



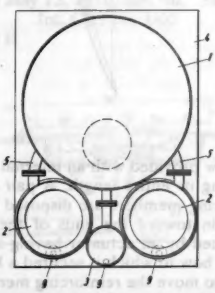
A black liquor recovery boiler is provided with a plurality of combustion zones for firing black liquor at a relatively constant rate and auxiliary fuel at variable rates. In response to signals indicative of the total paper plant steam demand and the rate of firing of black liquor, the air required for completing the combustion of black liquor and for firing auxiliary fuel is supplied to the boiler. The lesser of the plant steam demand signal and a signal indicative of the actual amount of air available in a selected combustion zone for firing auxiliary fuel operates a device for controlling the pressure of auxiliary fuel supplied to such combustion zone. The combustion air is apportioned to the plurality of combustion zones according to the actual amount of auxiliary fuel and black liquor supplied to each zone.

3,625,187

BOILER

Hans Viessmann, Battenberg/Eder, Im Hain, Germany

Filed Jan. 5, 1970, Ser. No. 623
Claims priority, application Germany, Jan. 4, 1969, P 19 01 438.1
Int. Cl. F22d *7/00*
U.S. Cl. 122—406 R **6 Claims**



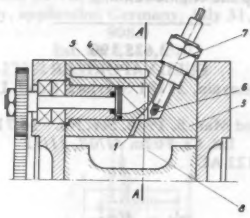
A boiler assembly comprises a boiler with an associated domestic water heater arranged below the boiler in a common enclosure, the heating water supply pipe to the heater leading from an upper region of the boiler to a lower region of the heater, the heating water return pipe leading from an upper region of the heater to a lower region of the boiler. A circulation pump is provided in the heating water circuit.

3,625,188

GLOW IGNITION DEVICE FOR ROTARY PISTON ENGINES

Stanislaw Jarnuskiewicz, Krakow, Swierczewskiego 29, Poland

Filed Nov. 20, 1969, Ser. No. 878,403
Claims priority, application Poland, Nov. 21, 1968, P 130.161
Int. Cl. F02b *53/08*
U.S. Cl. 123—8.19 **6 Claims**



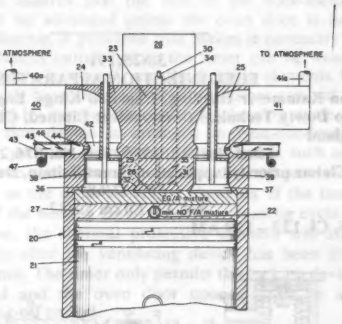
A rotary piston engine is provided with a chamber in which is a glow plug: a pair of passages, controlled by a rotary valve, communicate that chamber with the piston chamber or hollow, the passages entering the piston chamber or hollow substantially at the median plane of rotation of the rotary piston and at circumferentially spaced points.

3,625,189

METHOD AND APPARATUS FOR REDUCING EXHAUST EMISSIONS AND IMPROVING FUEL UTILIZATION IN INTERNAL COMBUSTION ENGINES

Phillip S. Myers, 3210 Oxford Drive, Madison, Wis., and Otto A. Uyehara, 1610 Waunona Way, Madison, Wis.

Continuation-in-part of application Ser. No. 615,145, Feb. 10, 1967, now Patent No. 3,494,336, Continuation-in-part of application Ser. No. 835,134, June 20, 1969, now Patent No. 3,507,261. This application Feb. 2, 1970, Ser. No. 7,641
Int. Cl. F02b *17/00*
U.S. Cl. 123—32 ST **2 Claims**



Method and apparatus for providing a stratified charge of two constituents in the combustion chamber of an internal combustion engine when the engine is operated at less than full load to reduce all three undesirable exhaust emissions, i.e., hydrocarbons, carbon monoxide and oxides of nitrogen. One constituent of the stratified charge comprises exhaust gas, mixed with air if desired; and the other a fuel/air mixture, having exhaust gases mixed therewith if desired, to produce reduced quantities of oxides of nitrogen. The exhaust gas portion of the exhaust gas/air mixture provided in the combustion chamber at all partial engine loads is selected from that portion of the exhaust gases which was formed by

the burning of the fuel/air mixture constituent of a previous stratified charge. At relatively heavy engine loads, when all of the exhaust gases formed by the burning of the fuel/air mixture constituent of a previous stratified charge cannot be recycled, a secondary selection is made to recycle either the bulk gases thereof (high in carbon monoxide) or the quench gases thereof (high in hydrocarbons) or all of one and as much of the other as possible.

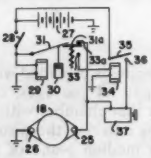
The relative amounts of the fuel/air mixture and exhaust gas/air mixture making up the stratified charge may be varied in response to accelerator position by auxiliary intake and exhaust timing valves which are actuated by variable timing control mechanism, with a maximum quantity of fuel/air mixture and a minimum quantity of exhaust gas/air mixture being introduced for full engine load, and vice versa for minimum load. During deceleration the fuel/air mixture intake can be completely cut off until engine idling speed is reached when, of course, a sufficient fuel/air mixture is again supplied to keep the engine running.

3,625,190

FUEL VAPORIZER

Mathew G. Boissevain, 27181 Sherlock Road, Los Altos Hills, Calif.

Filed Mar. 5, 1970, Ser. No. 16,714
Int. Cl. F02m *31/08, 31/12*
U.S. Cl. 123—122 AC **5 Claims**



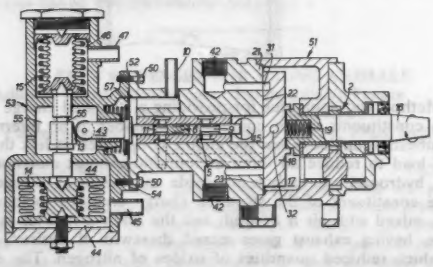
A rapid start fuel vaporizer for internal combustion engines employing a very rapid-acting heat exchanger that is heated either electrically or by exhaust gases or both to selectively vaporize the heavier fuel droplets which drop into the intake manifold from the engine carburetor without increasing intake air temperature. This vaporizer assembly is attached to the underside of the intake manifold directly below the downdraft carburetor and it is provided with a membrane of thin stainless steel or other material that resists oxidation caused by heating. A honeycomb, grid pattern, or closed convolutions between membrane and carburetor stagnates the intake air directly above the membrane, thus reducing heat transfer from the membrane surface to the intake air.

3,625,191

FUEL INJECTION APPARATUS

John Kammerer Harding, Charlton Kings, England, assignor to Dowty Technical Development Limited, Cheltenham, England

Filed Nov. 13, 1969, Ser. No. 876,276
Claims priority, application Great Britain, Dec. 12, 1968, 59,047/68
Int. Cl. F02m *59/32*
U.S. Cl. 123—139 AM **2 Claims**



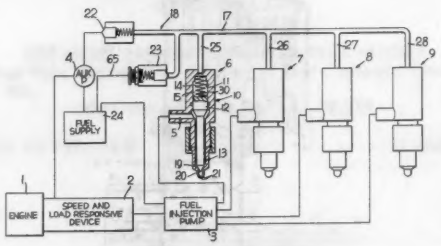
A fuel injection apparatus for a multicylinder internal combustion engine comprising an integrated unit formed in two easily separable parts of which the first part comprises a drive shaft for connection to the engine, a fuel pump, a fuel-metering device and a distributing valve to distribute the metered fuel to the engine injectors, and the second part comprises control means responding to the operating conditions of the engine and a mechanical adjuster set by the control means, the attachment together of the two parts being such as to connect the adjuster to the metering device for adjustment of the latter in accordance with the operating conditions of the engine.

3,625,192

FUEL INJECTION NOZZLE WITH HYDRAULIC VALVE-CLOSING MEANS

Alexander Dreisin, Olympia Fields, Ill., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 12, 1969, Ser. No. 884,491
Int. Cl. F02m *47/02*
U.S. Cl. 123—139 **10 Claims**



A fuel injection system having a nozzle with a differential valve normally biased to a closed position by means of a spring with augmentation of hydraulic means. The hydraulic means include a source of pressurized fluid with pressure-regulating means to provide a fluid pressure biasing the differential valve to a closed position.

3,625,193

ARCHERY BOW WITH VARIABLE BOW-TENSIONING DEVICE

James R. Palma, 1502 Curry Road, Schenectady, N.Y.

Filed May 21, 1970, Ser. No. 39,297
Int. Cl. F41b *5/00*
U.S. Cl. 124—23 **9 Claims**

An archery bow provided with an internal cavity extending substantially along its entire length. A pair of longitudinally movable reinforcing members are disposed in the cavity for movement therein toward the ends of the bow which are drivingly connected by an actuator having a shaft extending outwardly of the bow to which is secured a knob for rotation of said actuator to move the reinforcing members in opposite directions to thereby adjustably vary the tension force of said bow and thereby vary the force necessary to bend the bow.

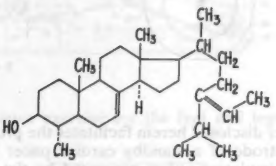
The bow has a pointer that indicates on a scale the adjusted tension force developed in the bow.

3,625,194

TRITERPENIC ALCOHOLS, PROCESS FOR THEIR PREPARATION AND THERAPEUTICAL COMPOSITIONS CONTAINING SAME

Henri Pinhas, Paris, France, assignor to Serdex-Societe D'Etudes, de Recherches de Diffusion Et D'Exploitation, Rue Aristide-Briand, France

Filed May 12, 1969, Ser. No. 823,719
Int. Cl. C07c *169/48*
U.S. Cl. 424—238 **16 Claims**



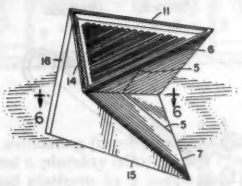
Citrostadienol, cycloartenol, 24-methylene-cycloartanol and 3 β-hydroxy-24-methyl-9-19-cyclo-9 β-lanosta-23-ene have analeptic, anti-inflammatory and connective tissue harmonizing properties.

3,625,195

SELF-SUPPORTING FOLDABLE STRUCTURES AND BLANKS THEREFOR

Terrand Bernard Grall, Sheboygan, Wis., assignor to Design Dynamics, Inc., Northfield, Ill.

Filed Nov. 10, 1969, Ser. No. 875,323
Int. Cl. A47b *3/00*; **B65d** *5/36*; **F24c** *1/16*
U.S. Cl. 126—9 A **15 Claims**



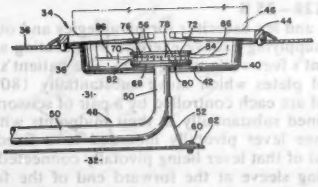
Self-supporting foldable structures made from preformed blanks of sheet materials are provided which are useful for portable barbeque grills and portable seating.

3,625,196

BURNER CAP ASSEMBLY

Albert F. Craver, Bay Village, Ohio, assignor to The W. J. Schoenberger Co., Cleveland, Ohio

Filed May 13, 1970, Ser. No. 36,907
Int. Cl. F24c *3/00*
U.S. Cl. 126—39 H **9 Claims**



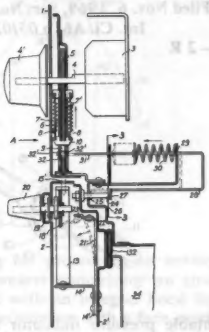
A combination of a steel burner cap, a burner cap mounting plate and a mixing tube. One end of the tube is adapted for connection to a gas manifold and the other end is connected to the mounting plate. Unobstructed openings intermediate the ends of the tube allow air to be aspirated when gas is injected from the manifold. The cap may be crimped to the plate for assembly tightness. Gas and primary air pass from the tube into the cap for further mixing while flowing radially out within the cap and subsequently through a plurality of ports. Ledges on the cap both above and below the ports extend radially outwardly to provide a flame shielding annular recess at the outer extent of the ports.

3,625,197

CONTROL DEVICE

Rudolf Pirker, Nurnberg; Walter Link, Nurnberg; Hans Grunbauer, Beiersdorf, and Roland Kelchner, Furth, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Dec. 8, 1969, Ser. No. 883,252
Claims priority, application Germany, July 31, 1969, P 19 38 908.3
Int. Cl. F24c *15/02*
U.S. Cl. 126—273 R **31 Claims**



A device for controlling the cleaning cycle of a self-cleaning oven. A timer mechanically actuates a mechanism for locking the oven door before the cleaning cycle begins. This door-locking device has a bolt which is retained either by a bimetallic element or by the timer itself. An additional latching device assures that the bolt of the door-locking device can not be advanced unless the oven door is fully closed. A mechanism is provided that makes it necessary to set the oven control switch before the timer can be wound up. Once the timer is wound, and the heating elements for the cleaning cycle have been actuated, the timer can not be unwound except by running through the cleaning cycle. A thermal protection device is arranged in heat-conductive communication with the oven. A ventilator device, such as a fan, is arranged so as to normally cool this thermal protective device, as well as the other switching elements. If the timer fails to shut off the heating element for the cleaning cycle at the proper time, the thermal protective element will shut them off shortly after the ventilating device has been shut down by the timer. The timer only permits the locking device to be unlocked and the oven door opened after an appropriate cooling-off period.

3,625,198

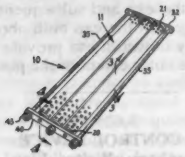
DIE AND HOLDER FOR IMPLANTING IN A LIVING BODY TO GROW TISSUE GRAFTS

Charles H. Sparks, 3725 S.E. Martins St., Portland, Oreg.

Continuation-in-part of application Ser. No. 655,838, July 25, 1967, now Patent No. 3,514,791. This application May 9, 1969, Ser. No. 823,287
Int. Cl. A61b *19/00*; **A61f** *1/24*
U.S. Cl. 128—1 **11 Claims**

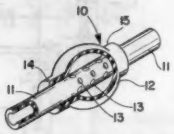
Method and apparatus for growing a graft structure, particularly in a patient's own body. A die cluster is disclosed

comprising a plurality of dies for growing graft tubes whereby such graft tubes may be connected together end to end to



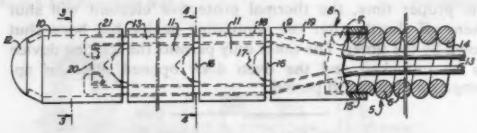
make a tube of desired length. The invention also includes an improved method for implanting the die cluster in the body.

3,625,199
IMPLANTABLE PRESSURE INDICATOR
George D. Summers, Bethesda, Md., assignor to Fairchild Hiller Corporation, Montgomery County, Md.
Filed Nov. 6, 1969, Ser. No. 874,467
Int. Cl. A61b *05/02*
U.S. Cl. 128—2 R **13 Claims**



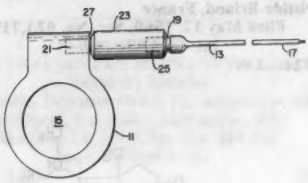
An implantable pressure indicator for detecting and indicating abnormal body fluid pressures in a body cavity or canal including a fluid conduit adapted to be connected to the body cavity or canal containing the body fluid whose pressure is to be measured and a distensible member associated with the fluid conduit. The distensible member can consist of a tubular sleeve, an elastic disc, or a longitudinally expandable bellows.

3,625,200
CONTROLLED CURVABLE TIP MEMBER
Wolf F. Muller, Southampton, N.Y., assignor to United States Catheter & Instrument Corporation, Glen Falls, N.Y.
Filed Aug. 26, 1969, Ser. No. 853,147
Int. Cl. A61b *10/00*; **A61m** *25/00*
U.S. Cl. 128—2.05 R **9 Claims**



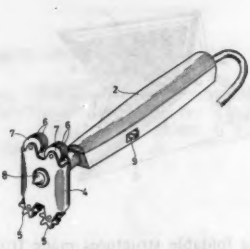
A wire-controlled curvable tip for a spring guide comprising solid cylindrical links engaging each other with nonlocking ball-and-socket type of articulation and adjustable to varying degrees of curvature by means of wires, each wire passing through a series of matching tunnels lengthwise of the links, secured at one end in the most distally located link and manipulated by applying differential tension to the other ends of the respective wires at the proximal end of the spring guide.

3,625,201
TESTER FOR STANDBY CARDIAC PACING
William P. Murphy, Jr, Miami, Fla., assignor to Cordis Corporation, Miami, Fla.
Filed Nov. 28, 1969, Ser. No. 880,801
Int. Cl. A61b *5/04*
U.S. Cl. 128—2.06 R **6 Claims**



The tester disclosed herein facilitates the proper placement of the electrode of a standby cardiac pacer by attenuating both the stimulating pulses generated by the pacer and the spontaneous cardiac signals which either inhibit or trigger the operation of the pacer during standby operation. A nonlinear network is employed for providing different attenuating factors.

3,625,202
ELECTRICAL INSTRUMENT FOR MEDICAL TREATMENT ON MOXACAUTERY AND ACUPUNCTURE
Sakae Oyoshirhara, No. 242, Akitsuki-cho, Ebisugawadori Kawabata Higashi, 6 Sujime Agaru, Sakyo-ku, Kyoto-shi, Japan
Filed Mar. 12, 1970, Ser. No. 18,996
Int. Cl. A61h *29/00*
U.S. Cl. 128—24.3 **1 Claim**

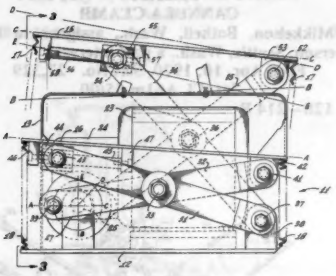


Star gearwheels, rubbing rollers and a projection are provided on a handle to be heated by an electrical source to a temperature, under which the skin of an affected part is treated with acupuncture and is applied by moxacautery.

3,625,203
FOOT AND LEG EXERCISER
Donald P. Wadelton, 11260 Nestle Ave., Northridge, Calif.
Filed Mar. 30, 1970, Ser. No. 23,896
Int. Cl. A61h *1/02*
U.S. Cl. 128—25 B **18 Claims**

A foot and leg exerciser for paraplegics and other inactive patients supplying passive exercise by elevating and lowering the patient's feet while tilting them. The patient's feet rest on individual plates which move substantially 180° C. out of phase and are each controlled by a pair of scissors-connected levers joined substantially at their midpoints with the lower end of one lever pivotally mounted to a fixed point, the upper end of that lever being pivotally connected to a traveling bearing sleeve at the forward end of the footplate the lower end of the other lever being pivotally connected to a motor-driven crank, and the upper end of the other lever being pivotally connected to the back end of the footplate.

The driving cranks are mounted displaced 180° C., and the resulting operation raises and lowers and tips the footplates

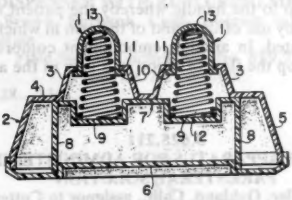


to provide passive exercise for the feet and legs of the patient.

3,625,204
TOOL FOR SIMULATING FINGER-PRESSURE TREATMENT

Ushinosuke Sekiguchi, 21-5, Imaya-Kami-machi, Kashiwa-shi, Chiba-ken, Japan

Filed Oct. 16, 1969, Ser. No. 866,895
Claims priority, application Japan, Oct. 14, 1968, 43/89674
Int. Cl. A61b *7/00*
U.S. Cl. 128—60 **6 Claims**

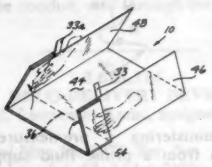


A tool for simulating finger-pressure treatment comprising a platform and a plurality of operating spherical bodies supported on said platform by a supporting cup and provided with operative head of part spherical shape projecting from the cup, between the platform and spherical bodies within the supporting cups, and spherical bodies being axially movable and supported so as to permit rocking movement in any operative position.

3,625,205
DISPOSABLE SURGICAL TOWEL

John J. Madden, Kearny, and Martin P. Galen, Livingston, both of N.J., assignors to Becton, Dickinson & Company, East Rutherford, N.J.

Filed May 8, 1970, Ser. No. 35,848
Int. Cl. A61f *13/00*; **A61l** *15/00*
U.S. Cl. 128—132 **5 Claims**

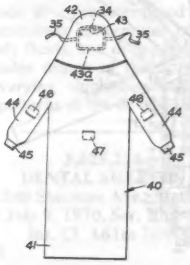


A surgical repair drape or towel is provided comprising a generally rectangular sheet of nonwoven material provided with a strip of double-faced adhesive on one surface. The drape is folded over on its outer surface from one longitudinal edge to form a cuff and thereafter folded inwardly from both transverse edges forming end sections. Each end section overlies adjacent portions of the center section thereby completely covering the inner surface of the drape and dividing the cuff into pockets. The adhesive extends adjacent the top margin of the cuff on the inner surface of the drape. The drape is so folded that a technician may unfold and apply the drape to a patient by handling only the outer surface and without necessitating any contact with the inner surface.

3,625,206
PROTECTIVE CLOTHING

John Charnley, "Naemoor" South Road, Hale, Cheshire, England

Continuation-in-part of application Ser. No. 746,426, July 22, 1968, now Patent No. 3,529,594. This application Nov. 3, 1969, Ser. No. 873,247
Int. Cl. A61b *19/00*
U.S. Cl. 128—142.5 **5 Claims**



Protective clothing for protecting an environment from contamination by a wearer comprising: an air-impermeable sleeved gown formed with an integral hood having a front opening therein in combination with a face mask in the front opening enabling a wearer to see out of the hood, connections for a suction line to the face mask for drawing air from the region of the wearer's face and cooling the wearer by causing an upward current of air over the body surface and extracting dust particles and bacteria emanating from the wearer's body.

3,625,207
RESPIRATORY MASK AND DUCTING

Boyd F. Agnew, 111 Via Lido Nord, Newport Beach, Calif.

Filed June 18, 1970, Ser. No. 47,414
Int. Cl. A61b *19/00*; **A62b** *23/06*
U.S. Cl. 128—146.2 **14 Claims**

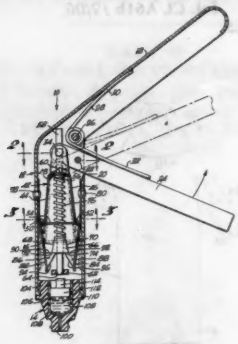
A suction ducting system for use under a conventional surgical mask comprises a pair of divergent hose sections joined at the back of a wearer's neck to a primary suction line. The divergent hose sections extend about the sides of the wearer's head adjacent his lower jaw and terminate at the cheeks in flattened substantially triangular ports. The ports lie against the wearer's cheeks and each diverges from its suction hose to a narrow, elongated mouth that lies closely adjacent to the wearer's cheek and extends from a point just below the side of the nose to a point between the corner of the mouth and

the chin. Resilient wire stiffeners extend through the suction hoses to resiliently clamp the ducting system to the wearer's head. The primary suction line is held in a vertical loop at the back of the head and is formed of a number of readily disconnectable sections that may be individually attached to the back of the wearer's gown. The flattened ports are covered by the mask.

3,625,208
APPARATUS FOR PRESSURE-ADMINISTERING MEDICAMENTS

Philip Frost, and Harry Van Der Gaast, both of Miami Beach, Fla., assignors to Mediquip Corporation

Filed May 19, 1969, Ser. No. 825,528
Int. Cl. A61m *11/00*
U.S. Cl. 128—173 H **4 Claims**

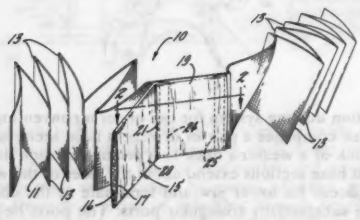


Apparatus for pressure administration of a fluent medicament in which a medicament-containing cartridge includes a needlelike outlet bore communicating with a chamber containing the medicament and includes a dispensing piston exposed at the rear end of the cartridge, and the cartridge is removably mounted on the barrel of a dispensing apparatus which includes a handle and actuator, in which the actuator controls a force transmitting assembly having a force transmitting rod directed toward the piston of the medicament cartridge and in which the force transmitting rod is subject to a buildup of axial pressure normally urging the rod toward the dispensing piston during an initial increment of travel and subsequently forcibly engages the piston during a terminal portion of the travel causing the medicament to be forcibly discharged at a skin-penetrating pressure from the needlelike outlet of the cartridge, and means for resetting the apparatus for subsequent use with another cartridge.

3,625,209
BANDAGE WITH COMPRESS PAD

Roland R. Clark, Rockford, Ill., assignor to Medical Supply Company, Rockford, Ill.

Filed June 26, 1969, Ser. No. 836,699
Int. Cl. A611 *15/01*
U.S. Cl. 128—169 **2 Claims**

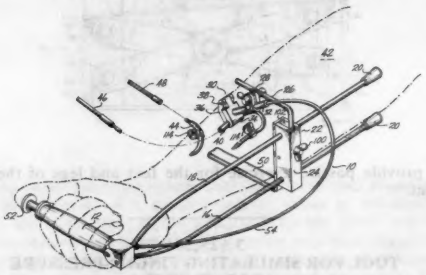


A bandage includes a compress pad which is secured to an elongated bandage strip of gauzelike material by strips of tape sandwiched between the pad and the gauze strip and each having pressure-sensitive adhesive on both faces to stick the pad to the gauze strip.

3,625,210
CANNULA CLAMP

Martin Mikkelson, Bothell, Wash., assignor to Harold V. McPherson, Seattle, Wash., a part interest

Filed Apr. 10, 1970, Ser. No. 27,329
Int. Cl. A61m *05/00*
U.S. Cl. 128—214 R **18 Claims**

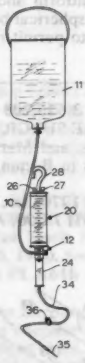


A device for holding a cannula connected to a vein or artery in the arm of a kidney machine patient comprising a handgrip having a longitudinal brace extending therefrom, the longitudinal brace including slidable support means for a clamp. The clamp having a bight portion peculiarly adapted to hold but not compress the cannula, and a cable extending from the clamp to the handle whereby the patient may actuate the clamp by use of the hand of the arm in which the cannula is implanted. In another embodiment compressors are provided to stop the flow of blood in a vein in the arm of the patient.

3,625,211
FAILSAFE APPARATUS FOR ADMINISTERING A PARENTERAL SOLUTION

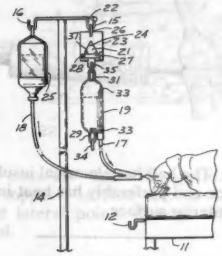
William F. Butler, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed June 6, 1969, Ser. No. 830,934
Int. Cl. A61m *05/14*
U.S. Cl. 128—214 C **4 Claims**



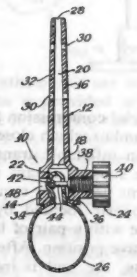
A set for administering a premeasured volume of parenteral solution from a prime fluid supply, utilizing a valve arrangement which prevents the possibility of the prime fluid supply being connected directly to the patient and enables repeat administration without manipulation of an antiair-entrainment valve.

3,625,212
ELIMINATING MISTAKES IN PLASMAPHERESIS
Ralph Rosenberg, Bay Harbor Island, and Sheldon Reich, Hollywood, both of Fla., assignors to North American Biologicals, Inc., Fort Lauderdale, Fla.
Filed July 9, 1969, Ser. No. 840,154
Int. Cl. A61m 05/00
U.S. Cl. 128—214 R 7 Claims



In plasmapheresis, this disclosure teaches a method for eliminating mistakes in returning a container of red blood cells to the correct donor. A mating plug and receptacle of distinctive shape are connected between the container and its support. If the plug and receptacle do not match, there is no convenient way to support the container for intravenous delivery of the red blood cells to the donor. The basic concept can be applied also to a wide variety of other services.

3,625,213
DISPENSER WITH RUPTURING MEANS
Frank E. Brown, Burbank, Calif., assignor to R. P. Scherer Corporation
Filed Sept. 22, 1969, Ser. No. 859,797
Int. Cl. A61m 1/00
U.S. Cl. 128—232 8 Claims



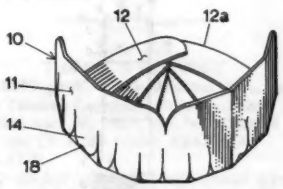
A dispenser for a fluid or fluidlike material, such as medicaments. A support member includes a conduit and an outlet on the conduit. The support member receives a puncturable, flexible capsule which contains a fluid substance. A puncturing member is operatively received by the support member and punctures a portion of the capsule so as to release fluid from the capsule. Pressure applied to the flexible capsule forces the fluid substance from the punctured capsule, into the conduit, and through the outlet to the place of application.

3,625,214
DRUG-DELIVERY DEVICE
Takeru Higuchi, Lawrence, Kans., assignor to Alza Corporation
Filed May 18, 1970, Ser. No. 38,237
Int. Cl. A61m 7/00
U.S. Cl. 128—260 14 Claims

A drug-delivery device for prolongedly delivering drugs to patients according to any predetermined time release profile, e.g., increasing, decreasing, constant, pulsing, sinusoidal, and like patterns of release, is fabricated by applying a drug coating of varying or uniform thickness to a relatively drug-impermeable film soluble in body fluids and thence rolling said coated film about itself in spiral or "jellyroll" fashion. Upon administration to the body, the outermost extremities of the

film gradually erode at a predetermined rate in body fluids thus exposing coextensive extremities of the drug coating, also soluble in body fluids, and drug is released to the tissues of the body. Suitable design of the drug coating along the spiral, e.g., of varying thickness, etc. provides for the aforesaid release patterns as the device disintegrates.

3,625,215
DENTAL SHEATHS
Sverre Quisling, 1240 Sherman Ave., Madison, Wis.
Filed July 9, 1970, Ser. No. 53,529
Int. Cl. A61m 7/00
U.S. Cl. 128—260 1 Claim

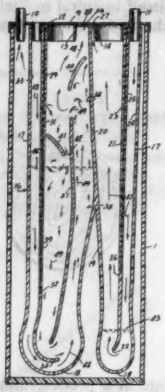


A disposable dental sheath of plastic-coated absorbent paperboard for applying medicament gels and liquids to the teeth and gums and covering recently filled or otherwise treated teeth, defective or missing teeth, and orthodonic appliances. The sheath has a curved front panel integrally connected along a foldline to a rear panel which is divided into a series of tabs overlapped in fantail relation. The medicament is placed in the sheath for treatment of the teeth and gums. The front panel may have an outline of teeth formed thereon along the foldline.

3,625,216
DISPOSABLE WATER SEAL AND SUCTION CONTROL BAG
Karl A. Pannier, Jr.; Gordon S. Reynolds, and James L. Sorenson, all of Salt Lake City, Utah, assignors to LeVoy's, Inc., Salt Lake City, Utah
Filed Apr. 24, 1970, Ser. No. 31,581
Int. Cl. A61m 1/00
U.S. Cl. 128—277 15 Claims

A disposable bag for disposition between a source of suction and a container for collecting drainage from the body of a patient after severe wounding of or surgery performed on

the patient, the bag having a suction control section and a water seal section and is fixedly attached to a canister cover,



both the bag and cover being discarded after usage with a single patient or whenever desired.

3,625,217

APPARATUS FOR EXTRACTING SNAKE POISON FROM WOUNDS

Johan George Schmidt, Gibsonstraat 31, Deventer, Netherlands

Filed May 28, 1969, Ser. No. 828,523
Claims priority, application Germany, May 30, 1968, P 17 66 485.6
Int. Cl. A61m *1/00*
U.S. Cl. 128—300 **11 Claims**

A suction device for extracting poison, particularly snake poison, from wounds which comprises a cylinder having an open end and a hand-operable piston displaceable in the cylinder in opposite directions. With the open end applied to the area directly surrounding the wound and upon movement of the piston in one direction, partial vacuum is created in the cylinder in the region of the open end, as a result of which poison is extracted from the wound and sucked into the cylinder.

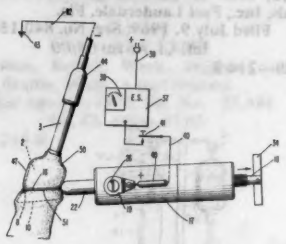
3,625,218

APPARATUS FOR ELECTROSURGICAL CIRCUMCISION

Joseph R. Valinoti, Jr., 80 Lake Road, Manhasset, N.Y.

Filed Mar. 14, 1969, Ser. No. 807,188
Int. Cl. A61n *3/00*
U.S. Cl. 128—303.14 **9 Claims**

A method and apparatus employing a high-frequency electric current having a bell as one electrode inserted within the foreskin and having a relatively fine stainless steel wire tightly encircling the foreskin at the position where the foreskin is to be cut. The wire serves as the other electrode and overlies an opposed area of the bell within the foreskin. A source of high-frequency current has its leads connected to the bell and wire, and current of cutting frequency, suitably timed for the cut to be made, is applied to effect the cut



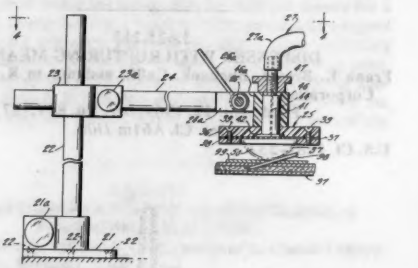
beneath the wire. The bell has electrical insulation applied to its exterior surface and preferably has heat-insulation material applied to its interior surface.

3,625,219

APPARATUS TO FACILITATE SEALING OF ARTERIAL PUNCTURES

Raymond M. Abrams, 29 Old Pond Road, Great Neck, N.Y., and Elliott R. Beranbaum, 110 Bleeker St., New York, N.Y.

Filed Jan. 3, 1969, Ser. No. 788,874
Int. Cl. A61b *17/12;* **A47f** *5/10;* **A62b** *35/00*
U.S. Cl. 128—325 **4 Claims**



A device for arterial compression to promote formation of a blood clot or thrombus which closes an arterial puncture is constructed with an inflatable transparent expandable pad unit. An adjustable support means mounted to a base supports the transparent pad in its required operative position. The patient is properly located by body-positioning pads located on the base with a pair of belts maintaining the patient in such operative position. After the unit is placed over the arterial opening, the unit is inflated to a point where blood does no more than merely ooze from the arterial opening and pulsing indications of blood pressure within the artery in question become observable on a gauge connected to read pressure within the transparent chamber. The arterial compression is observable through the pad and the clot is usually formed properly a short time after blood stops oozing.

3,625,220

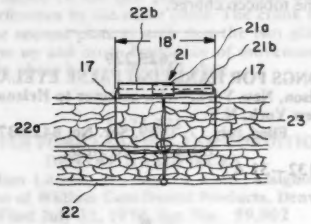
EXTENDIBLE SUTURE GUARD

Harvey J. Engelsher, Yonkers, N.Y., assignor to Horizon Industries, Ltd., Bronx, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,353
Int. Cl. A61b *17/04*
U.S. Cl. 128—335 **9 Claims**

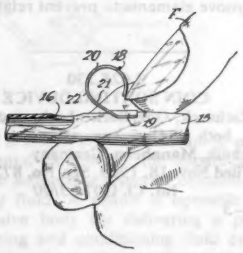
A retention suture guard is formed of a pair of semirigid inner and outer tubes arranged in telescoping relationship. Locking means between the tubes permit their relative axial movement in one direction to lengthen the device incrementally as desired, while providing substantial resistance to relative axial movement in the opposite direction. In practice, the ends of a suture extend through exit points in the skin on

opposite sides of a wound, with one end of the suture being threaded through the central bore of the suture guard. The tubes of the guard are then telescopically extended to have a total length equal to the distance between said exit points,



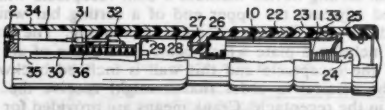
and the suture ends are tied. The guard thus provides a generally flat support surface across the wound, and establishes fixed lateral points through which the suture's tension is applied.

3,625,221
FLAP-TROL SUCTION CATHETER
Joseph H. Corbett, Fort Edward, N.Y., assignor to Sherwood Medical Industries Inc.
Filed July 29, 1969, Ser. No. 845,682
Int. Cl. A61m *25/00*
U.S. Cl. 128—351 **4 Claims**



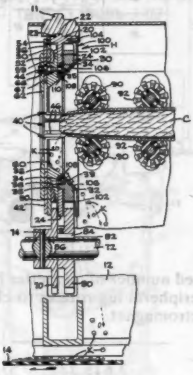
An airway suction catheter for use in aspirating applications. The catheter tube is provided adjacent a distal end thereof with an aperture for varying the suction. A manually operable valve is carried on the catheter adjacent the aperture for adjustably closing the aperture and correspondingly adjusting the suction.

3,625,222
BATON-TYPE ARREST DEVICE
Kunio Shimizu, No. 33-2, 1-chome, Asagaya Minami, Suginami-ku, Tokyo, Japan
Original application Dec. 6, 1966, Ser. No. 599,446, now Patent No. 3,523,538, dated Aug. 11, 1970. Divided and this application Mar. 9, 1970, Ser. No. 17,419
Int. Cl. A61n *1/04, 1/20;* A61m *21/00*
U.S. Cl. 128—405 **5 Claims**



A pair of needle electrodes which are slightly spaced and are adapted to pierce the skin are normally concealed into a cylindrical casing but projected to pierce the skin only when the casing is pressed against the skin and in contact therewith. A minute electric current sufficient to create in the human body a false state of epilepsy is applied to the human body through the needle electrodes under the skin.

3,625,223
SELF-CLEARING CORN CUTTERHEAD
Robert E. Shuler, Hoopeston, Ill., assignor to FMC Corporation, San Jose, Calif.
Filed Oct. 8, 1970, Ser. No. 79,158
Int. Cl. A01f *11/06*
U.S. Cl. 130—9 **5 Claims**



A rotary corn cutterhead has a housing, an annular cutterhead gear, a knife anchor assembly rotatable in the housing and forming a conical entrance throat that rotates. Radial knives are formed on the assembly and project into the entrance throat. A fixed conical deflector overlies the axially outer portion of the entrance throat to serve as a gravity delivery chute for the kernels, whereas the axially inner portion of the throat presents a rotating conical surface to the knives and hence is self-cleaning. A radial scraper is mounted on the fixed conical deflector and overlies the rotating conical surface of the entrance throat.

3,625,224
TOBACCO PRODUCT
John Charles Leffingwell, Winston-Salem, N.C., assignor to R. J. Reynolds Tobacco Company, Winston-Salem, N.C.
Filed Apr. 30, 1969, Ser. No. 820,619
Int. Cl. A24b *15/04;* A24d *01/06*
U.S. Cl. 131—17 R **14 Claims**

Addition of methyl and ethyl substituted pyridine compounds to tobacco to enhance the flavor and aroma.

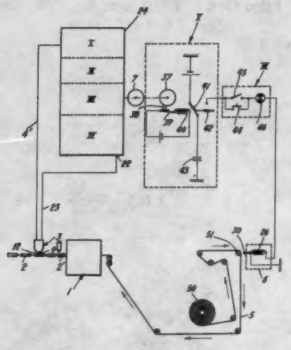
3,625,225
RECONSTITUTED TOBACCO
Howard Martin Halter, Norwalk, Conn., assignor to AMF Incorporated
Filed July 24, 1969, Ser. No. 844,652
Int. Cl. A24b *03/14, 13/00*
U.S. Cl. 131—17 AC **5 Claims**

A reconstituted tobacco composition and method of manufacturing same wherein a slurry of tobacco and solvent is created and has added thereto ethylhydroxyethyl cellulose as a burn improver.

3,625,226
COUNTING AND MARKING DEVICE
Jacques Flesselles, Fleury-les-aubrais, France, assignor to Service d'Exploitation Industrielle des Tobacs et des Alumettes, Paris, France
Continuation of application Ser. No. 325,570, Jan. 22, 1963, now abandoned , which is a continuation of application Ser. No. 835,889, June 12, 1969, now abandoned. This application Feb. 9, 1970, Ser. No. 9,096
Int. Cl. A24c *05/32*
U.S. Cl. 131—21 B **5 Claims**

A marking device for the wrapper in a cigarette-making machine including a photoelectric device for counting

cigarettes at the discharge end of the machine arranged to energize an electromagnet which moves a pencil into momentary contact with the wrapper tape within the machine.



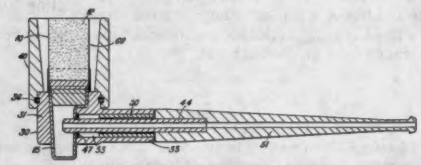
When a preselected number of cigarettes has been counted, a drum having a peripheral lug rotates to close a switch which energizes the electromagnet.

3,625,227

PIPE-LIKE SMOKING DEVICE FOR USE WITH TOBACCO CARTRIDGES

Kenneth B. Fether; David B. L. Brickwood, and Peter Steer Sampson, all of London, England, assignors to Imperial Tobacco Group Limited, Bristol, England

Filed Aug. 8, 1969, Ser. No. 848,514
Int. Cl. A24f *5/00*
U.S. Cl. 131—225 **7 Claims**



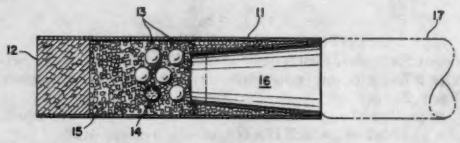
A pipelike smoking device for use with cartridges of tobacco. A mouthpiece, a bowl constructed to hold the cartridge, and a stem provide communication from the stem through the bowl to the cartridge. The stem projects into the bowl and penetrates the cartridge to provide the communication between the mouthpiece and the interior of the cartridge. Concurrently, the stem releasably retains the cartridge within the bowl.

3,625,228

HEAT ACTIVATED FILTER FOR SMOKING DEVICES

Mortimer Russell Dock, New York, N.Y., assignor to The H-2-O Filter Corporation, New York, N.Y.

Filed Oct. 16, 1969, Ser. No. 866,812
Int. Cl. A24d *01/06*; **A24f** *13/06*
U.S. Cl. 131—262 **2 Claims**



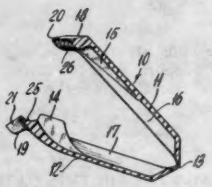
This invention relates to a filter for smoking devices wherein the heat caused by combustion of the tobacco products causes the release of encapsulated fluid and the consequent moistening of the filtering material disposed within the device. The fluid is retained in capsules the walls of which are constituted of waxlike material which is melted when the heat of the smoke is concentrated in "jet" form thereon by a truncated conical baffle the smaller end of which is in proximity to the capsules and the larger end is close to the tobacco charge.

3,625,229

TONGS FOR HANDLING FALSE EYELASHES

Victor Silson, New York, N.Y., assignor to Helena Rubinstein, Inc., New York, N.Y.

Filed July 17, 1969, Ser. No. 842,637
Int. Cl. A45d *2/00*
U.S. Cl. 132—31 A **2 Claims**



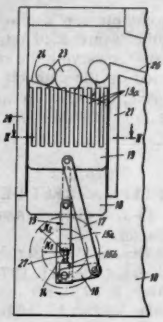
A tongs having an integral molded hinge joining a pair of legs, each leg having a crosspiece at its outer end, the crosspieces being curved to grasp the lashes of a false eyelash and to exert an even pressure on all the lashes when the crosspieces flex under closing forces, the legs having interlocking tongue-andtgroove elements to prevent relative sliding of the crosspieces.

3,625,230

COIN SORTING DEVICE

Herbert K. Zschaeck, Oberflockenbach, and Karl Rothinger, Plankstadt, both of Germany, assignors to Firma Kontex Kontrolltechnik, Mannheim, Germany

Filed Nov. 18, 1969, Ser. No. 877,690
Int. Cl. G07d *3/00*
U.S. Cl. 133—3 **11 Claims**



A coin-sorting device includes a coin receptacle which is arranged adjacent the upper end of a sorting bar which is inclined for the feeding of coins therealong. The sorting device includes a plate which bears on a plane of an inner wall of the receptacle and this wall is inclined backwardly from the vertical in order that it might receive the coins placed in the receptacle. Crank means are provided for moving the plate upwardly and downwardly. In its upper position an inclined top edge of the plate is aligned with the inclined sorting bar. Coins which are moved to the edge of the plate during its downward movement, because of the inclined deposition of receptacle and the rear wall thereof, are lifted upwardly by the plate until its lowermost edge is alongside the end of the sorting bar at which point the coins will roll off the plate onto the bar. In order to insure that the coins

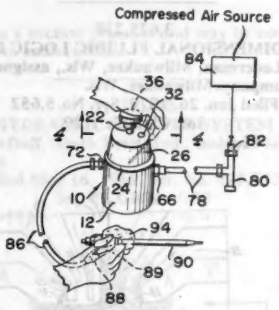
become trapped on the plate, and that no other coins interfere with the rolling movement, a second plate is arranged for up and down movement in a location directly overlying the first plate and it provides a shielding effect in respect to the other coins in the receptacle in order to hold the coins which are trapped on the first plate and permit their rolloff without interference by the other coins. The crank means for operating the second plate is such that the two plates move with the same up and down frequency of movement but the second lags in phase behind the first plate.

3,625,231

APPARATUS FOR CLEANING AND CONDITIONING DENTAL HANDPIECES

George William Littrell, Jr., Aurora, Colo., assignor to Densco Division of William Getz Dental Products, Denver, Colo.

Filed July 31, 1970, Ser. No. 59,902
Int. Cl. B08b *9/00, 13/00*
U.S. Cl. 134—102 **9 Claims**



This invention is an apparatus for cleaning and conditioning air-driven dental handpieces, the apparatus including a valve body which supports a reservoir containing a cleaning and conditioning fluid. A piston is operable through the reservoir and valve body for delivering a predetermined amount of cleaning and conditioning fluid carried by the piston, into a stream of a carrier gas, the carrier gas and fluid being expelled under pressure from the valve body through the dental handpiece, for removing foreign material from the internal parts and conditioning these parts.

3,625,232

CONTINUOUS PICKLING LINE FOR ENDLESS SHEETS

Rudolf Speelmanns, Hilden (Rhld.), and Freidrich Wilhelm Delwig, Dusseldorf, both of Germany, assignors to Moeller & Neumann GmbH, Ingbert Saar, Ensheimer Str., Germany

Filed May 16, 1969, Ser. No. 825,376
Claims priority, application Germany, May 16, 1969, P 17 71 402.2
Int. Cl. B08b *3/08, 1/02*
U.S. Cl. 134—122 **5 Claims**

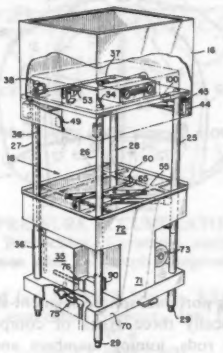
A pickling line for continuously travelling endless sheets consisting of a subdivided acid trough 1 with individual cover plates 20 removable in sections, a driving device 31 for pulling the sheet and a loop pit 24 mounted in front of the acid trough without means to effect a back pull.

3,625,233

DISH WASHING MACHINE

Creston R. Southard, Old Town, N.C., assignor to Creston Equipment Corporation, Winston-Salem, N.C.

Filed June 19, 1969, Ser. No. 834,743
Int. Cl. B08b *3/02*
U.S. Cl. 134—165 **10 Claims**



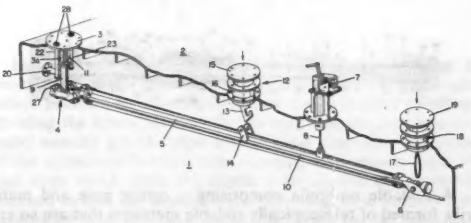
This invention relates to a new and improved dish-washing machine accessible from all four sides thereof making it suitable for straight through or corner-type installation. The vertical legs are utilized for supporting the washer and receiving the electrical and plumbing mechanisms.

3,625,234

CLEANING OF THE INTERIOR OF STORAGE TANKS

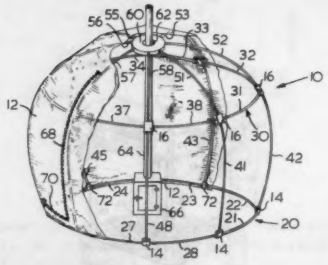
David J. Baldwin, London, England, assignor to Sybron Corporation, Rochester, N.Y.

Filed July 27, 1970, Ser. No. 58,599
Int. Cl. B08b *3/02, 9/08*
U.S. Cl. 134—167 R **15 Claims**



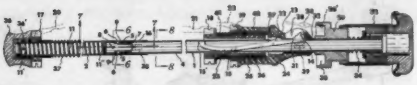
Device for tank-cleaning apparatus having a flanged mounting extending through and carried by the hatch, closure or top of a tank to be cleaned and an elongated pipe pivotally connected at one end to the flanged mounting inside of the hatch, closure or top and carrying the tank-cleaning apparatus at the other end. The tank-cleaning device is raised up out of the tank and locked into an inoperative storing position or lowered into the tank and locked into an operating position. Raising and lowering is controlled externally of the tank. Cleaning fluid is introduced to the tank-cleaning apparatus through the pivotal connection which communicates with the elongated pipe.

3,625,235
PORTABLE SHELTER
Peter Gorgichuk, 108 McNaughton Street, Sudbury, Ontario, Canada
Filed June 29, 1970, Ser. No. 50,688
Claims priority, application Canada, July 3, 1969, 056070
Int. Cl. A45f *1/00*
U.S. Cl. 135—1 **8 Claims**



A free-standing portable, sphere-segment-shaped, shelter is made from basically three types of components; initially straight resilient rods, joining members and, of course, a cover. The rods are bent into arcs within their elastic limit so that two circles are formed and these are separated and a dome provided by other initially straight rods similarly bent elastically; a top joining member in the form of a circular plate can have a central hole to provide ventilation and an outlet for a stovepipe.

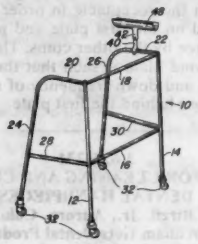
3,625,236
FOLDABLE UMBRELLA
Gonzaburo Hayano, 8 Takauda Hondori 6-chome, Higashiosaka-shi, Osaka-fu, Japan
Filed Apr. 22, 1970, Ser. No. 30,721
Claims priority, application Japan, Oct. 6, 1969, Oct. 7, 1969, Oct. 8, 1969; 44/95626, 44/95929, 44/96377
Int. Cl. A45b *25/16*
U.S. Cl. 135—22 **4 Claims**



A foldable umbrella comprising a center pole and main ribs formed of telescopically slidable members that are so arranged as to be opened or closed by movable rings slidably mounted on the center pole. Both the center pole and the main ribs are automatically opened by spring means in engagement with the movable rings and the pole members, and are substantially reduced in size owing to the telescoping of their members when the umbrella is manually closed.

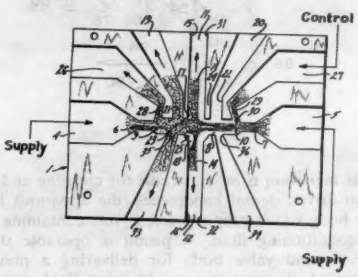
3,625,237
ARM SUPPORT FOR INVALID WALKERS
Mabel L. Wertz, 1301 N. Astor St., Chicago, Ill.
Filed Apr. 13, 1970, Ser. No. 27,716
Int. Cl. A61h *3/00*
U.S. Cl. 135—45 A **1 Claim**

An arm support for invalids using walkers which is adjustable in all directions, either longitudinally, diagonally or vertically, and is capable of being placed on either the right-hand side of the upper tubular rails of the walker, or the left-hand



side, and, if desired, could be placed on the front upper member of the walker.

3,625,238
TWO-DIMENSIONAL FLUIDIC LOGIC DEVICE
Warren A. Lederman, Milwaukee, Wis., assignor to Johnson Service Company, Milwaukee, Wis.
Filed Jan. 26, 1970, Ser. No. 5,652
Int. Cl. F15c *1/20*
U.S. Cl. 137—81.5 **9 Claims**

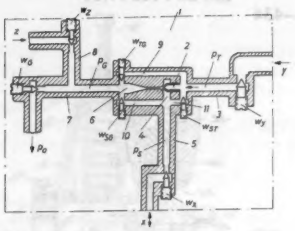


A pair of opposing airstreams impact within a rectangular chamber having opposed stream-confining sidewalls. A pair of opposite impacting streamflows are established and flow into a pair of passageways provided in the first sidewalls with each passageway having axially spaced planar lock-on walls to one of which the impacting streamflow attaches as a result of fluid entrainment. Control passageways and related output passageways are connected to the chamber in one of said first walls to the opposite sides of the passageways. Main stream bleed passageways are connected to the opposite sides of the first impact flow passageway in the second or opposite of the first sidewalls. The impacting flow lock-on to the corresponding planar walls of the first bleed passageways results in flow and pressure in the corresponding output passageway. A control stream applied to one main stream associated with the free lock-on wall reduces the stream strength to shift the impact flow to the opposite lock-on walls and an output is created in the other output passageway.

3,625,239
TRANSFER ELEMENT FOR A MEASURING OR CONTROL DEVICE
Horst Bader, Stuttgart-Fasanenhof, Germany, assignor to J. C. Eckardt A.G., Stuttgart-Fasanenhof, Germany
Filed Dec. 10, 1968, Ser. No. 782,633
Claims priority, application Switzerland, Dec. 22, 1967, 18077/67
Int. Cl. F15c *1/00*
U.S. Cl. 137—81.5 **12 Claims**

A transfer element for a measuring or control device which is operated by the flow of a pressure medium, in which a jet apparatus of a type known as such is employed for bringing at least two fluid-pressure values into operative association

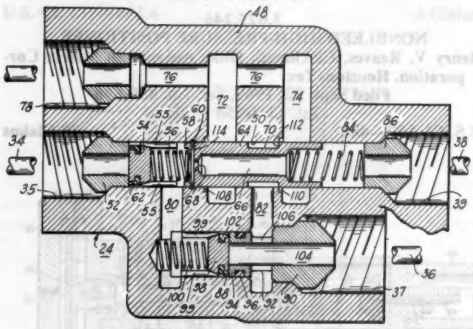
with each other which may be applied by separate conduits so as to serve selectively as a main jet pressure, as a back pressure, or as a suction pressure and may be controlled by a throttle valve in each conduit.



3,625,240
HYDRAULIC BOOSTER SYSTEM

Stanley I. MacDuff, South Bend, Ind., assignor to The Bendix Corporation

Filed May 16, 1969, Ser. No. 825,353
Int. Cl. G05d *1/00*
U.S. Cl. 137—113 **3 Claims**



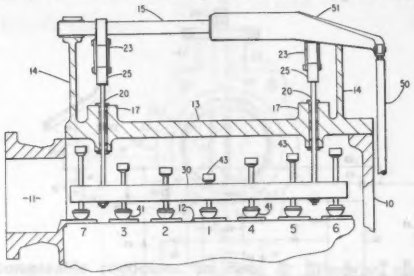
A hydraulic booster system for a vehicle which is operable when the vehicle's engine is running and also when the engine is not running provided the vehicle is in motion. Said hydraulic booster system including a flow control valve means for connecting a second pump means to the system upon partial or complete fluid pressure failure of a first pump means.

3,625,241
STEAM ADMISSION VALVE STRUCTURE FOR STEAM TURBINES

James Rodger Shields, Pittsburgh, Pa., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Oct. 16, 1969, Ser. No. 867,017
Int. Cl. F16k *1/00, 31/44*
U.S. Cl. 137—630.19 **2 Claims**

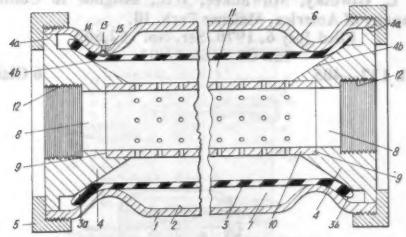
The valves are moved toward and from the seats by a valve lift bar provided with removable split bushing in which the valve stems are slidable. The stems are formed with enlarged integral head portions dimensioned to pass through the apertures in the bar in which the bushings are mounted. The heads are engaged by the bushings upon upward movement of the bar. Means is provided for proper vertical adjustment of the bushings in the bar to cause sequential movement of the valves form their seats upon upward movement of the lift bar.



3,625,242
PRESSURE ACCUMULATOR

Fritz Ostwald, Buchschlag, Germany, assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,215
Claims priority, application Germany, Jan. 17, 1969, P 19 02 217.4
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **1 Claim**



In a pressure accumulator having a cylindrical housing, a coaxial perforated pipe supported within the housing through which pressure medium flows and an elastic tubular partition dividing the space between the housing and the pipe into an outer annular gas chamber and an inner chamber. The ends of the cylindrical housing have recessed sections and tapered end rings which press the elastic tube against the recessed sections to seal the accumulator. The rings also support the perforated tube and have means for fitting the accumulator in a pressure line.

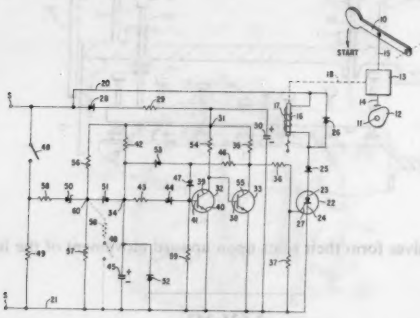
3,625,243
TIME CYCLE WARP-STOP MOTION CONTROL FOR WEAVING LOOMS

Harry P. Hansen, Martinsville, and Warren A. Barber, N. Plainfield, both of N.J., assignors to The Singer Company, New York, N.Y.

Filed Feb. 13, 1970, Ser. No. 11,241
Int. Cl. D03d *51/00*
U.S. Cl. 139—336 **7 Claims**

A circuit is disclosed for controlling the energization of the solenoid for actuating the conventional power-stop motion of a weaving loom in the event either of power failure or of breakage of warp threads. A silicon-controlled rectifier

(SCR) is connected in series with the solenoid and an AC voltage supply. Gating of the SCR is controlled by a unique transistor flip-flop circuit, the state of which is responsive to two different threshold voltages established at a control point. The voltage at the control point is determined by an



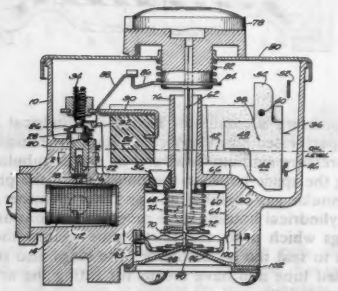
RC charging and discharging circuit conditionally responsive to the drop wire contacts. The RC circuit is adjusted so that a definite charging time must elapse after the opening of the drop wire contacts until the flip-flop changes state to gate the SCR into conduction. This time is made longer than the time of a pick-cycle of the loom.

3,625,244

OIL CONTROL VALVE FLOW METERING ARRANGEMENT

Harry L. Giwosky, Milwaukee, Wis., assignor to Controls Company of America, Melrose Park, Ill.

Filed July 6, 1970, Ser. No. 52,603
Int. Cl. F16k *11/02*
U.S. Cl. 137—405 **6 Claims**



Oil flows into the control valve body past the float controlled inlet valve to maintain a constant level in the body. The thin metering disc is rotatable to multiple positions in which a metering orifice underlies the float chamber outlet to accurately meter the flow. The undulating track cast in the body cooperates with the spring-loaded rollers on the bottom of the metering stem to give a detent action to registry of the metering holes. When the knob is turned to "off" the spring arm acts on the link to lift the float and force the inlet valve closed. If the oil level rises too high (due to leaking inlet valve), the inverted, L-shaped safety float flips clockwise to wedge in the valve-closing position until manually reset.

3,625,245

TIP FOR VALVE MEMBER AND METHOD OF ASSEMBLING SAME

William A. Biermann, Brookfield, Wis., assignor to Controls Company of America, Melrose Park, Ill.

Filed Nov. 13, 1969, Ser. No. 876,532
Int. Cl. F16k *31/26*
U.S. Cl. 137—434 **6 Claims**

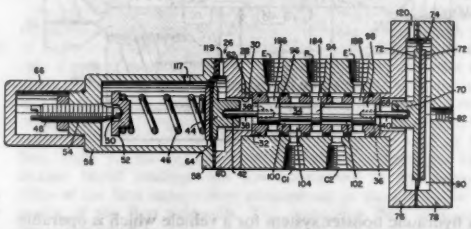
The needle valve stem of a float-controlled valve is provided with a tip made of resilient material such as a fluoroelastomer. The end of the valve stem includes a cylindrical bore and the resilient tip has a cylindrical portion disposed in that bore which has a relaxed diameter greater than the diameter of the bore. The tip is inserted in the bore by stretching its cylindrical portion axially to reduce the diameter of the cylindrical portion. Once in the bore, the stretching force is released whereupon the tip tends to return it its relaxed state and in doing so creates an inherent bias which acts against the bore walls to hold the tip on the valve stem. The tip includes an annular, convex in transverse cross section projection which engages an unobstructed surface surrounding the valve orifice through which flow occurs. The tip closes the orifice to flow and does so without protruding into the orifice.

3,625,246

NONBLEED HIGH-PRESSURE POSITIONER

Henry V. Reaves, Cincinnati, Ohio, assignor to Matrix Corporation, Houston, Tex.

Filed Sept. 22, 1969, Ser. No. 859,698
Int. Cl. G05d *16/06*
U.S. Cl. 137—488 **20 Claims**



The positioner actuates a pipeline control valve, utilizing the full pressure of the pipeline for its operation, and is constructed to minimize bleeding and waste of the pipeline fluid in normal operation. Automatic operation depends entirely upon pressure differentials in the pipeline system.

3,625,247

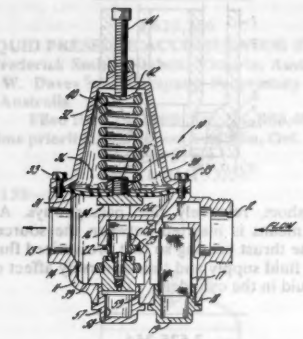
PRESSURE REGULATOR WITH PRESSURE RELIEF VALVE

Theodore A. Dargatz, Rockford, and Charles F. Leonard, Belvidere, both of Ill., assignors to Eclipse Fuel Engineering Co., Rockford, Ill.

Filed Oct. 27, 1969, Ser. No. 869,599
Int. Cl. G05d *16/06*
U.S. Cl. 137—493.2 **5 Claims**

A pressure regulator valve having an inlet port for connecting the valve to a high-pressure supply of water and communicating with a passageway which extends into a chamber formed in the valve body, the passageway and the chamber

communicating with one another through an opening in one wall of the passageway. The chamber communicates directly with an outlet port for connecting the valve to a service pipe. To block the opening when the pressure in the chamber rises to a predetermined value, a valve element is moved into engagement with the wall of the passageway. A ball-type pressure relief valve is formed directly in the valve element itself to allow water to flow reversely from the chamber to the passageway when the pressure in the chamber rises above the pressure in the passageway.



3,625,248

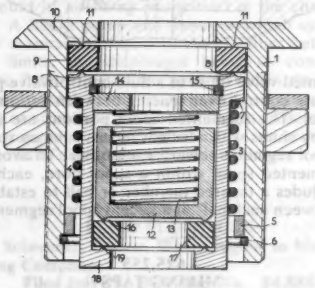
AUTOMATIC PRESSURE-EQUILIBRATING VALVES

Philippe Lhotellier, Montrichard, (Loir et Cher), France

Filed Dec. 4, 1969, Ser. No. 882,153

Int. Cl. F16k *17/18*

U.S. Cl. 137—493.6 **4 Claims**



A pressure-equalizing valve includes a passage having a first valve seat at one end for cooperation with a longitudinally movable sleeve member, the sleeve having a second valve seat spaced longitudinally from the first valve seat for cooperation with a cup-shaped member in the sleeve; the sleeve and the cup-shaped member being urged into engagement with the respective valve seats by helical springs.

3,625,249

ECCENTRIC DAMPER-TYPE VALVE FOR CONTROLLED ACTION

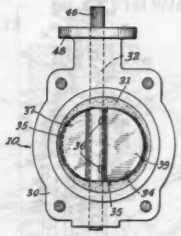
James F. Karr, 38 Joe De Diego, Mayaguez, P.R.

Filed Feb. 26, 1970, Ser. No. 14,496

Int. Cl. F16k *3/04, 3/22*

U.S. Cl. 137—527 **9 Claims**

An eccentric damper-type valve disposed across a flow line and which is adapted to open under pressure of the flow on the larger of the two uneven sections of the valve on either side of the valve shaft, whereby the total upstream pressure on the valve being unequal on the opposite sides of the shaft, the resulting differential of pressures enables manual or mechanical (automatic or not) operation of the valve with a lower expenditure of force than would be required under comparable conditions, to open or otherwise operate a completely unbalanced check valve.



3,625,250

ELECTROHYDRAULIC CONTROL APPARATUS FOR CONSUMER VALVES

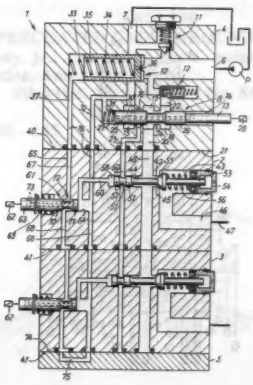
Heinz Flaschar, Asperg; Klaus Schneider, Ludwigsburg, and Heinz Kleinschmidt, Stuttgart-Wangen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Sept. 16, 1970, Ser. No. 72,771

Claims priority, application Germany, Sept. 23, 1969, P 19 48 038.7

Int. Cl. F16k *11/00, 11/00*

U.S. Cl. 137—596.12 **14 Claims**



The apparatus comprises an operation control unit, and a plurality of consumer control units with consumer conduits for a plurality of hydraulic motors. The consumer conduits are individually controlled by spring-biased consumer valves which are, respectively, actuated under control of single-stroke electromagnets. The operation control units include a spring-biased control valve actuated by another single-stroke electromagnet to connect inlet means and outlet means, respectively, through a connecting conduit with all consumer control units.

3,625,251

HYDRAULIC COUPLER

Vaughn A. Nelson, Downers Grove, Ill., assignor to International Harvester Company, Chicago, Ill.

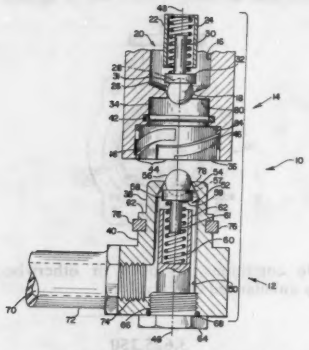
Filed Apr. 15, 1970, Ser. No. 28,834

Int. Cl. F16k *15/18*

U.S. Cl. 137—614.04 **3 Claims**

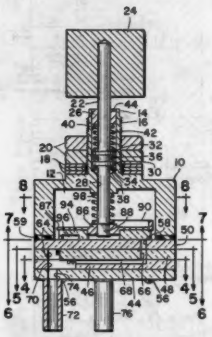
A quick disconnect valved hydraulic coupling characterized in that telescoping components are engaged and dis-

engaged by rotating them with respect to each other. Additionally, means are included that automatically disengage the



coupling when an elongating force is applied to a conduit that communicates with one of the telescoping components.

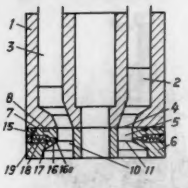
3,625,252
LINEARLY VARIABLE LINEAR FLUIDIC RESISTOR
Thomas W. Bermel, Corning, N.Y., and Nicholas Lazar, Scranton, Pa., assignors to Corning Glass Works, Corning, N.Y.
Filed Apr. 23, 1968, Ser. No. 723,387
Int. Cl. F16k *11/52*
U.S. Cl. 137—625.3 **18 Claims**



A variable linear fluid resistor in which a variable number of restricted paths connect two chambers to which the terminal fittings are connected. In addition to providing linear pressure flow characteristics, a linear relationship between rotary resistance adjusting motion and resistance is obtained.

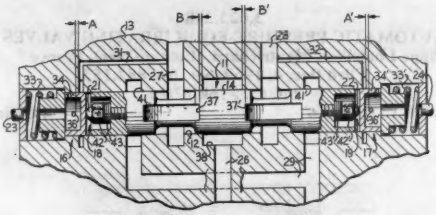
3,625,253
HYDRAULIC UNIT
Kurt Christiansen, Oberbuchsiten, Switzerland, assignor to Firma Von Roll AG, Gerlafingen, Switzerland
Filed Dec. 1, 1969, Ser. No. 881,159
Claims priority, application Switzerland, Dec. 5, 1968, 18204/68
Int. Cl. F16k *11/02*
U.S. Cl. 137—652.21 **6 Claims**

A hydraulic unit is disclosed having a rotating cylinder block in which a plurality of pistons move within axial cylinders, and a stationary control surface controlling the flow of fluid to and from the cylinders. A portion of the pressurized control fluid is taken from the fluid supply and is fed to a fluid thrust bearing means surrounding the control surface, which fluid bearing permits substantially frictionless rotation of the cylinder block relative to the control surface. The fluid bearing preferably comprises a plurality of circumferentially spaced pockets in the surface of the control body facing the cylinder block annularly disposed outside the control surface, the pockets being connected in communication with one



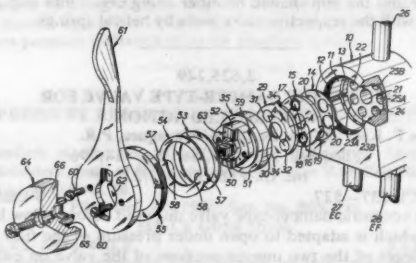
another by short, relatively fine passageways. A suitable check valve means is inserted between the source of fluid supply and the thrust bearing so that pressurized fluid cannot return to the fluid supply and thus adversely affect control of the flow of fluid in the cylinders.

3,625,254
SEGMENTED VALVE SPOOL
Roger A. Rice, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 12, 1970, Ser. No. 18,997
Int. Cl. F16k *11/07*
U.S. Cl. 137—625.66 **16 Claims**



A segmented valve spool in a fluid control valve permitting very accurate control over spacing between various portions of the spool. The segmented spool portions are selectively separated by shims with resilient means such as springs urging the spool segments toward each other. To avoid binding of the segmented spool within a spool bore, each shim assembly includes a tapered member or ball to establish point contact between each pair of adjacent spool segments.

3,625,255
MIXING TAPS
Bernard Genin, 137 Rue du Chemin Vert, Paris 11e, France
Filed Sept. 26, 1969, Ser. No. 861,308
Claims priority, application France, May 22, 1969, 6,916,636
Int. Cl. F16k *11/02*
U.S. Cl. 137—637.3 **7 Claims**



Improvements in mixing water taps, comprising two similar closure members, one member being keyed in the tap body

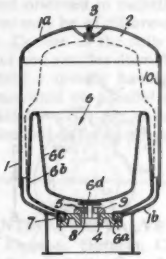
while the other member is keyed inside a distributor core rotatably mounted in the tap body. The improvements relate especially to the provision of a spigot member permitting total modulation of the mixed water delivered by the tap, and also to the arrangement of nonreturn valves which prevent undesired flow from one of the inlet pipes to the other.

3,625,256

LIQUID PRESSURE ACCUMULATOR SYSTEMS

Victor Frederick Smith, Highett, Victoria, Australia, assignor to F. W. Davey and Company Proprietary Limited, Victoria, Australia

Filed Dec. 29, 1969, Ser. No. 888,491
Claims priority, application Australia, Oct. 13, 1969, 62,221/69
Int. Cl. F16l *55/04*
U.S. Cl. 138—30 **1 Claim**



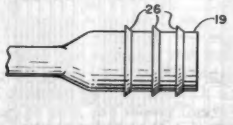
A liquid pressure tank is provided for storing liquid under pressure for use in domestic or commercial reticulated supply of the type having an impervious diaphragm dividing the tank into an air chamber and a liquid chamber, a constant amount of air being maintained in the chamber under pressure. A liquid pump and pressure switch system is provided for maintaining liquid in the chamber between preset pressure limits, the diaphragm being so configured and secured to form a pistonlike portion within the tank which reciprocates under variation of liquid pressure to minimize wrinkling or stretching of the diaphragm. Also a fixed plate can be arranged over the liquid outlet as protection from rupturing of the diaphragm at low liquid levels.

3,625,257

FLUID FLOW TUBE

Harry J. Schroeder, Racine, Wis., assignor to Modine Manufacturing Company

Filed July 15, 1970, Ser. No. 54,886
Int. Cl. F16l *9/18, 9/02*
U.S. Cl. 138—109 **5 Claims**



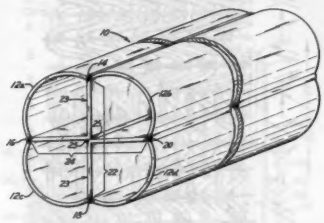
A fluid flow tube of a plastically deformable metal such as aluminum, brass, copper and the like of generally oval cross section and divided by one or more integral longitudinal walls or ribs into a plurality of parallel fluid flow passages in which an end of the tube is formed to circular cross section with a smooth interior to provide an attachment for fittings in which the rib or ribs and internal fins where used are blended into the sidewall to comprise integral structurally indiscernible reinforcing parts of the wall of this tube end.

3,625,258

MULTIPASSAGE PIPE

Rex V. Phelps, Tulsa, Okla., assignor to Warren Petroleum Corporation, Tulsa, Okla.

Filed Mar. 16, 1970, Ser. No. 19,825
Int. Cl. F16l *9/18*
U.S. Cl. 138—115 **2 Claims**



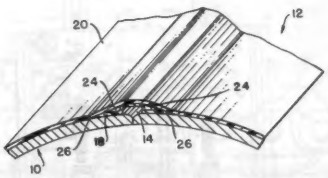
A multichannel pipe of reduced wall thickness and increased rigidity consists in a plurality of elongated strips welded along their lateral edges to one another. The strips are of arcuate shape in a direction transverse to their length to form a tubular structure. Webs extend from each juncture of two strips across the pipe to another juncture. The angles included by the arcs of the strips are such that the angle at which the strips and the webs meet is larger than 90°. The radius of curvature of the arcs on which the strips are curved is less than the radius of a circle having the same cross-sectional area as the pipe. In the preferred method of manufacture of the pipe the web structure is assembled and the arcuate strips then welded to one another and the ends of the webs.

3,625,259

PRECOATED UNDERGROUND PIPING

Ted Kennedy, Jr., Ann Arbor, Mich., assignor to The Trenton Corporation, Ann Arbor, Mich.

Filed Oct. 15, 1969, Ser. No. 866,612
Int. Cl. F16l *9/14*
U.S. Cl. 138—145 **4 Claims**



A protective cover for an underground conduit having a raised weld. The cover consists of a relatively hard corrosion-resistant precoating applied over the weld, and an elongated protective strip wrapped around the conduit, with or without a primary coating under the strip.

ERRATUM

For Class 139—336 see:
Patent No. 3,625,243

3,625,260

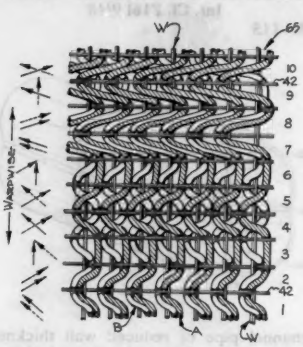
FABRICS WITH INTRICATE PILE ARRANGEMENTS

James E. Troy, Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Continuation of application Ser. No. 822,851, Dec. 8, 1969. This application Jan. 27, 1970, Ser. No. 6,119
Int. Cl. D03d *27/06*
U.S. Cl. 139—402 **41 Claims**

This invention is directed to a variety of fabrics in which sets of warpwise extending pile yarns, preferably of different

visual characteristics, extend weftwise over one or more groups of ground warp yarns to form warpwise rows of pile in the form of straight or oblique lines of pile, with the pile being in the form of loops or cut pile tufts of the same or different sizes and arranged in any desired pattern. Also, by floating at least one set of pile yarns, certain areas of the fabrics may be of lesser pile density, with such floating enhancing the variety of color effects obtainable.

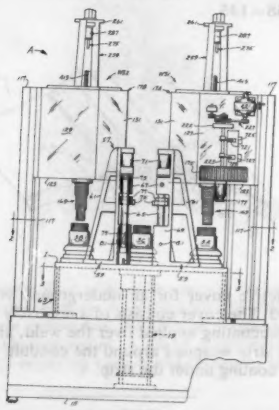


3,625,261

APPARATUS FOR WINDING AND PLACING COILS IN THE SLOTS OF A STATOR

Donald E. Hill, Fort Wayne; Stanley D. Payne, Fort Wayne, Ind., and Robert G. Walker, Brighton, Mich., assignors to Industra Products Inc., Fort Wayne, Ind.

Filed July 29, 1969, Ser. No. 845,804
Int. Cl. H02k *15/00*; B21f *3/04*
U.S. Cl. 140—92.1 **21 Claims**



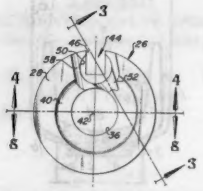
Apparatus for winding and placing coils in the slots of a stator comprising a rotary index table carrying three sets of placer fingers spaced at 120° intervals, each set being adapted to hold a plurality of pole windings for a stator. The table is adapted to be indexed successively to bring each set of placer fingers from a first winding station to a second winding station, thence to a placing station, and thence back to the first winding station, with a dwell at each station. At each of the winding stations, there is provided a coil winding and transfer mechanism including a coil form, a flyer for winding coils on the coil form, and means for transferring coils from the coil form to the set of placer fingers at the respective winding station. Each set of placer fingers is indexable during its dwell at each winding station for reception of successive sets of coils in proper position for placement of the coils in the stator. After the winding of coils and their transfer to the set of fingers at the first winding station, the table is indexed to bring this set of fingers with the coils thereon to the second winding station. After the winding of additional coils and their transfer to the set of fingers at the second winding station, the table is indexed to bring the set of fingers with the coils thereon to the placing station, where a stator is placed on the fingers and the coils are pushed into the slots of the stator. The stator with the coils in its slots is then removed, and the table indexed to bring the set of fingers to the first winding station to start another cycle.

3,625,262

CONDUCTOR WRAPPING BIT AND METHOD FOR FORMING A SURFACE THEREON

William J. Baker, Reed City, and Richard J. Hurst, Hersey, both of Mich., assignors to Gardner-Denver Company, Quincy, Ill.

Filed May 29, 1969, Ser. No. 828,822
Int. Cl. B21f *3/02*, *15/00*
U.S. Cl. 140—124 **4 Claims**



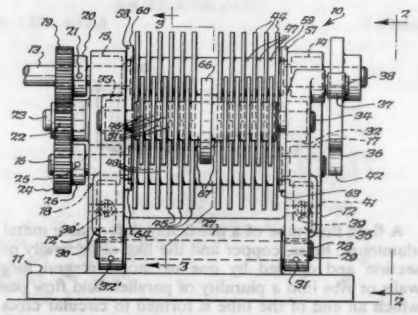
A rotary bit for wrapping conductor wire about a terminal in helical convolutions to form an electrical connection. The bit includes a longitudinal terminal-receiving bore and a conductor wire-receiving groove in radially offset parallelism therewith. A wire-camming surface slopes radially inwardly from the transverse end face of the bit to the terminal bore and includes a helical rise for continuously camming and supporting a major portion of successive wire convolutions. A wire guide surface intersects the conductor groove and sloped camming surface for feeding the wire into camming position. The sloped camming surface is formed by a rotary form machining tool which is simultaneously rotated relative to the bit longitudinal axis and axially moved relative to the bit end face.

3,625,263

ROLL BENDING MACHINE AND METHOD

John F. Kopczynski, 1671 Sweeney St., North Tonawanda, N.Y.

Filed Mar. 7, 1969, Ser. No. 812,534
Int. Cl. B21f *1/02*
U.S. Cl. 140—147 **32 Claims**



A method and machine for straightening an elongated wirelike workpiece wherein the machine includes a plurality

of substantially parallel shafts each mounting a series of spaced coaxial rolls with at least one of said series being radially movable into overlapping relationship with the other series to define a central opening, and cam means for sequentially varying the orientation of the series of rolls relative to each other to provide a first opening between the rolls which is sufficiently large to receive the wire in a radial direction, a second opening which is relatively small for providing an overbending action in which axial portions of the wire are bent back and forth while the wire is rotated about its longitudinal axis while in engagement with the rolls, a third opening which is larger than the second opening to provide straightening action wherein the wire is continued to be rotated about its own axis in an opening which is substantially the same diameter as the wire while in contact with the rolls so as to straighten it, and a fourth opening wherein one of the series of rolls is moved away from the others to permit the workpiece to drop out of the opening in a radial direction. The cam means may be of a contour so as not to include the overbending action when this is not required. All of the rolls of adjacent series may be axially staggered relative to each other and oriented in radially overlapping relationship. The rolls also may be of different hardnesses in certain roll orientations. Certain of the rolls of each series may alternately be of larger and smaller diameter.

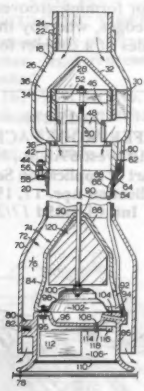
A machine for rotating a spindle having first, second, and third series of rolls mounted on parallel shafts with the rolls of each series being axially offset and radially overlapping the rolls of the other series and defining a space therebetween to receive the spindle.

3,625,264

ANTISTATIC VALVE

Leonard W. Swain, London, Ontario, Canada, assignor to Emco Limited, London, Ontario, Canada

Filed Oct. 7, 1970, Ser. No. 78,789
Claims priority, application Canada, Feb. 20, 1970, 075,381
Int. Cl. B65b *39/00*
U.S. Cl. 141—198 **12 Claims**



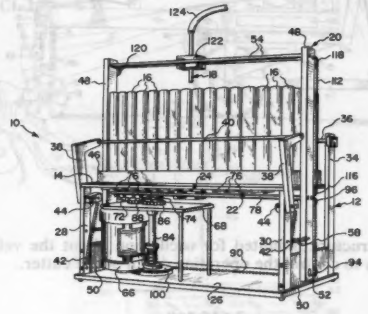
A flow control valve for reducing the buildup of static electricity in a liquid when loading a liquid into a storage tank. The valve is actuated by a float which senses the level of liquid in the storage tank and moves the valve between a position wherein the flow through the valve is restricted to an open position wherein the flow through the valve is substantially unrestricted. The float is adapted to activate an expandable diaphragm valve when the level of liquid in the tank rises above the level of the upper end of the discharge orifice which opens into the tank. The expandable diaphragm valve moves the many valve closure members between the open and closed positions as required in use such that the flow of liquid into the tank is quite slow until the discharge orifice is covered and thereafter the valve opens rapidly to permit full flow into the tank.

3,625,265

FRACTION COLLECTOR

Warren E. Gilson, 4801 Shebaygan Ave., Madison, Wis.

Filed Jan. 7, 1970, Ser. No. 1,191
Int. Cl. G01n *1/18*
U.S. Cl. 141—284 **11 Claims**



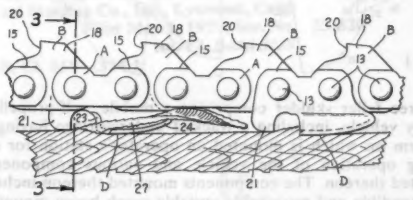
A fraction collector includes structure pivotally mounted for tilting movement about a generally horizontal axis in order to move a filling head in one direction over an array of containers. Movement is imparted to the filling head in accordance with the movement of a drive member, and the drive member is confined to a predetermined pattern of movement by means of a maze structure through which the drive member is moved.

3,625,266

CHIP EJECTOR CHAIN TOOTH

Paul H. Kennemore, P.O. Box 12, Greenwood, S.C.

Filed Nov. 21, 1969, Ser. No. 878,659
Int. Cl. B27b *33/14*
U.S. Cl. 143—135 G **1 Claim**



A saw chain having a plurality of spaced teeth coupled together by means of tie straps and drive links. Each of the teeth has an elongated substantially vertical sideplate and a top plate. A chip ejector is integral with the top plate and sideplate for turning chips during a cutting operation upwardly and laterally from the top plate in order to aid in ejecting the chips from the kerf.

3,625,267

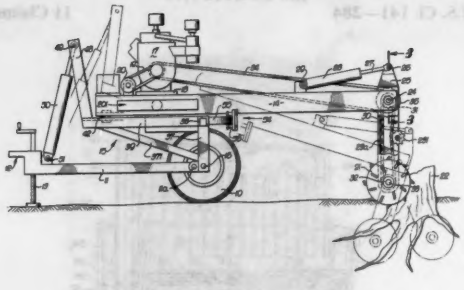
STUMP REMOVAL MACHINE

Robert E. Welborn, Lafayette, Ind., assignor to Wayne Manufacturing Company, Pomona, Calif.

Filed Dec. 11, 1969, Ser. No. 884,218
Int. Cl. A01g *23/06*
U.S. Cl. 144—2 N **11 Claims**

A vehicle-mounted stump removal machine employs a

cutter-carrying boom mounted for lateral swinging above the vehicle wheels, the boom being carried by a cradle or supporting structure mounted for oscillation about the vehicle wheel axis to control the operating depth of the cutter.



3,625,268

FELLING HEAD RECIPROCATING BLADE TYPE

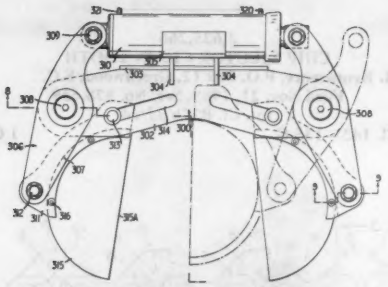
Carl Kempe, Ornskoldsvik, Sweden, assignor to Canadian International Paper Company; Quebec North Shore Paper Company, Montreal, Quebec and Abitibi St. Anne Paper Ltd., Beaupre, Quebec, Canada, part interest to each

Continuation of application Ser. No. 639,883, May 19, 1969, now abandoned. This application Feb. 6, 1970, Ser. No. 9,391

Claims priority, application Canada, May 20, 1966, 960,903

Int. Cl. A01g *23/08*

U.S. Cl. 144—34 **77 Claims**



A tree feller skidder comprising a mobile, self-propelled unitary vehicle, including a tracked undercarriage having a platform on which is mounted an operator's station for effecting operation of the vehicle and various components mounted thereon. The components mounted thereon include an extendible and retractable variable-reach boom mounted for slewing about a vertical axis and having a felling head pivotally attached to the free end thereof, pivotal movement being about a horizontal axis and controlled by a hydraulic motor. The felling head consists of a grapple and shear mounted in fixed spaced relation relative to one another and each has jaw members movable in a direction toward and away a plane passing between the jaw members. The grapple grasps a vertical standing tree and the shear located therebelow severs the tree from its stump, the grapple and shear jaws being controlled by respective ones of two different hydraulic actuators. The shear includes a pair of shear blades mounted on a frame, each by a link member and one further pivotal connection, the latter, in one form, consisting of a cam and cam follower respectively, a slot in the frame and a pin on the respective shear blade or holder therefor. A further component mounted on the vehicle consists of a bunk for anchoring the end of the felled trees to the vehicle and includes an upwardly facing jaw controlled from the operator's station, the jaw being defined by a plurality of arcuate arms pivotally mounted and spaced longitudinally along the length of the bunk between a pair of upstanding posts.

3,625,269

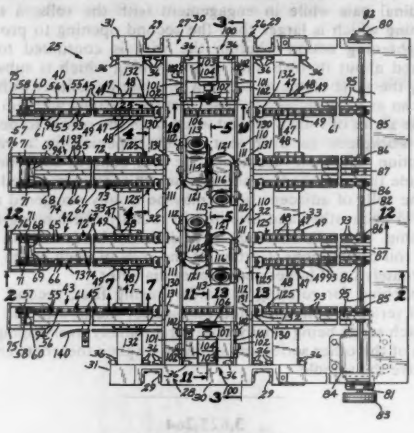
WOODWORKING MACHINE

Leif A. Holan, Winona, Minn., assignor to Leif A. Holan; William Wernz and Rudolph Miesbauer, Winona, Minn.

Filed May 9, 1969, Ser. No. 823,370

Int. Cl. B27f *1/02*

U.S. Cl. 144—136 R **4 Claims**



A frame having a plurality of cutting heads mounted thereon, two of the cutting heads including a pair of rotary saws mounted in planes lying at approximately 90° to each other and intersecting along a line through the panel being cut at a position spaced a predetermined distance from the outer planar surface of the panel so as to form grooves for two plain miter joints, and two cutting heads mounted to coincide with either edge of the panel each including a router and a circular saw for forming grooves for rabbet joints and trimming the outer edges, whereby the entire panel can be formed into three sides of a cabinet for TV, speakers, or the like.

3,625,270

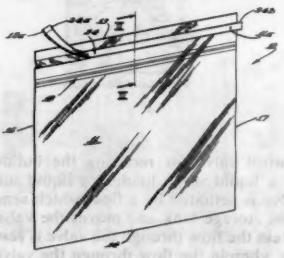
PILFERPROOF PACKAGE

Milorad Skendzic, 110 West 69th St., New York, N.Y.

Continuation-in-part of application Ser. No. 817,080, Apr. 17, 1969. This application Apr. 17, 1970, Ser. No. 29,602

Int. Cl. B65d *17/20*

U.S. Cl. 150—3 **3 Claims**



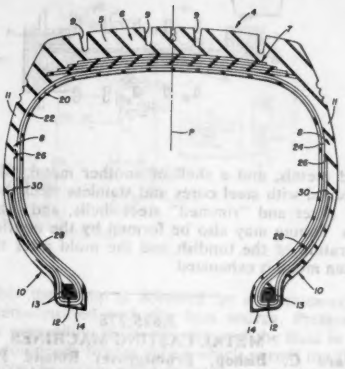
A pilferproof plastic bag having reclosable interlocking members and a tear ribbon which forms an access opening when pulled from the bag. The tear ribbon protrudes from the side of the bag for easy finger gripping.
A method of and means for making the bag by cutting and heat-sealing the sides to form completely sealed side edges having the tear ribbon protruding therefrom.

3,625,271

RADIAL TIRE WITH STRENGTHENED BEAD TIE-IN

Harry Lewis Hutch, 3810 Englewood Drive, Stow, Ohio

Filed July 13, 1970, Ser. No. 54,276
Int. Cl. B60c 9/08
U.S. Cl. 152—354 6 Claims



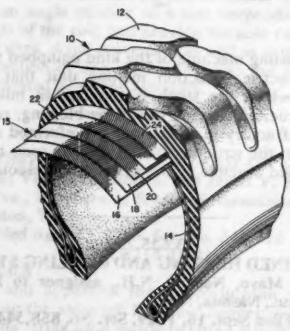
The annular margins of a radial ply carcass are plaited or folded back and turned around the bead cores such that the bead portion and, if preferred, the lower or inner portions of the sidewalls of the tire are reinforced by four layers of ply cords while the remainder of the tire carcass reinforcement is in the form of a single layer of cords. Thus, in one tire, advantages of a single radial ply carcass reinforcement are combined with advantages of a two-ply "tie-in" at the beads. The plaited margins can be either turned "up" or turned "down" around the bead cores thereby locating each folded terminal edge of the carcass either outside or inside the bead cores.

3,625,272

PNEUMATIC TIRES

Henry R. Fletcher, deceased, late of Birmingham, England (by Agnes Marion Fletcher, legal representative), assignor to Dunlop Holdings Limited

Filed July 16, 1969, Ser. No. 20,267
Claims priority, application Great Britain, July 16, 1968, 33,747/68
Int. Cl. B60c 9/16
U.S. Cl. 152—357 16 Claims



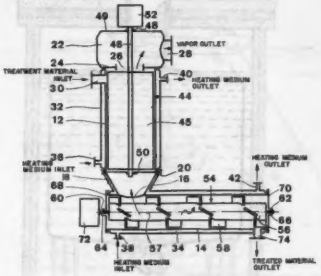
A pneumatic tire incorporating a flexible energy-absorbing layer of fine steel wires for protection of the carcass and/or breaker of the tire against damage by e.g. concussive forces or for reducing the transmission of vibrational energy from the ground of the carcass and thence to the vehicle to which the tire is fitted.

3,625,273

THIN FILM APPARATUS HAVING A TWO-PART HEAT TREATMENT CHAMBER

Albert Buschor, Urdorf, Switzerland, assignor to Luwa AG, Zurich, Switzerland

Filed Nov. 12, 1969, Ser. No. 875,961
Claims priority, application Switzerland, Nov. 15, 1968, 17066/68
Int. Cl. B01d 1/22
U.S. Cl. 159—6 W 7 Claims



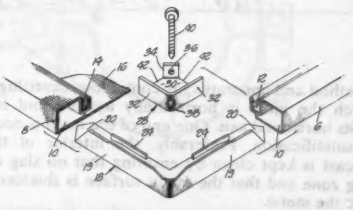
A thin film apparatus is disclosed for converting materials suspended in a liquid medium into a powdery form, comprising a pair of substantially cylindrical heat treatment chambers having their axes disposed at an angle to each other, each of the chambers having rotatably mounted therein an agitating rotor or spreader member. In a preferred form of the invention, the first or upper chamber is disposed substantially vertically and communicates with the lower or second chamber by means of a connector member; the second chamber may be horizontal or inclined towards its discharge end either upwardly or downwardly from the first chamber.

3,625,274

ADJUSTABLE FRAME FOR CANVASES

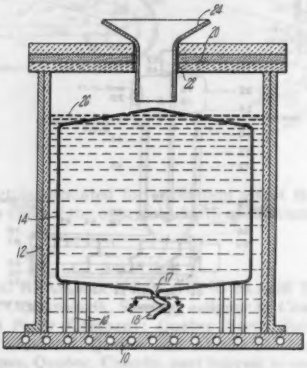
James B. Johnson, South Pasadena, Calif., assignor to Universal Molding Co., Inc., Lynwood, Calif.

Filed May 1, 1970, Ser. No. 33,820
Int. Cl. B44d 3/18
U.S. Cl. 160—374.1 1 Claim



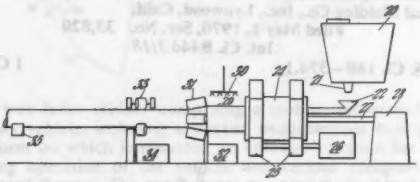
An adjustable frame, such as for artists canvases and silks, including tubular metal side and end members joined by frictionally retained corners and having spline grooves in the rear faces of the side and end members for the retention of materials stretched over the frame, and means provided at the corners for forcing the end and side members apart to slightly enlarge the dimensions of the frame and tighten the canvas or other material.

3,625,275
APPARATUS AND METHOD FOR SINGLE-CRYSTAL CASTING
Stephen M. Copley, Madison; Anthony F. Giamei, Middletown; Merton F. Hornbecker, Woodbury, and Bernard H. Kear, Madison, all of Conn., assignors to United Aircraft Corporation, East Hartford, Conn.
Filed Mar. 13, 1969, Ser. No. 806,978
Int. Cl. B22d 25/06
U.S. Cl. 164—60 9 Claims



Apparatus and method for producing single-crystal parts having a relative large dimension at right angles to the major axis, for example, discs or plates, or rods or ingots having a large cross-sectional area.

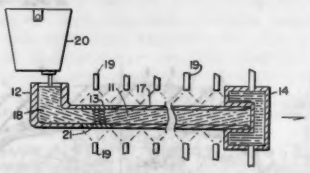
3,625,276
CENTRIFUGAL CASTING OF TUBES INCLUDING SLAG SEPARATION
William Howard Considine, Storrington, Sussex, and Derek Slater, Hoathly, Sussex, both of England, assignors to The A.P.V. Company Limited, Sussex, England
Filed Feb. 10, 1969, Ser. No. 797,879
Int. Cl. B22d 13/10
U.S. Cl. 164—84 10 Claims



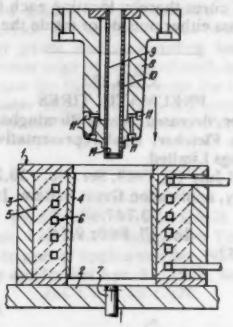
A method and apparatus for continuous centrifugal casting in which the mold is horizontally located and is rotating about its horizontal axis. One end of the mold is cooled to initiate solidification. Preferably, the interior of the tubing being cast is kept clean by ensuring that no slag enters the cooling zone and that the metal surface is shielded by a gas inert to the metal.

3,625,277
CONTINUOUS CASTING PROCESS
Leonard Watts, Cedarhurst, N.Y., assignor to Technicon Instruments Corporation, Tarrytown, N.Y.
Continuation-in-part of application Ser. No. 705,491, Feb. 14, 1968, now Patent No. 3,517,725, dated June 30, 1970. This application Apr. 13, 1970, Ser. No. 27,607
Int. Cl. B22d 11/06
U.S. Cl. 164—86 8 Claims

A tundish receiving a first molten metal and a closed end mold are moved apart relative to each other so that the mold forms a solidified shell of a billet, molten metal flowing through the solidified shell to the mold. During the casting, a second or altered molten metal is introduced into the tundish to flow through the elongating billet so that a continuously cast billet is produced with a core of one metal, a layer of alloyed metals, and a shell of another metal. Billets may be produced with steel cores and stainless steel shells, "killed" steel cores and "rimmed" steel shells, and other combinations. Tubing may also be formed by the continued relative separation of the tundish and the mold after the source of molten metal is exhausted.



3,625,278
METAL CASTING MACHINES
Edward C. Bishop, Bromsgrove; Roland P. Chapman, Redditch, and John W. Coleman, Northfield, all of England, assignors to The British Motor Corporation Limited, Birmingham, England
Filed July 17, 1969, Ser. No. 842,549
Claims priority, application Great Britain, Aug. 6, 1968, 37415/68
Int. Cl. B22c 15/24
U.S. Cl. 164—201 6 Claims

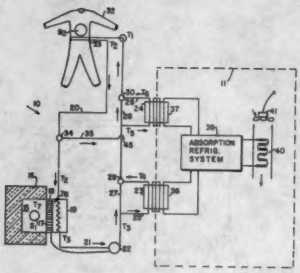


A metal casting machine of the kind equipped with a high-frequency electric induction melting unit that includes a crucible to which the stock is supplied in billet form; in which the crucible is made in situ by blowing, resin-bonded powdered refractory material into a preformed mold cavity established in the structure of the melting unit, and subjecting the molded crucible to the action of a gaseous hardening agent.

3,625,279
COMBINED HEATING AND COOLING SYSTEM
Kenneth E. Mayo, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed Sept. 16, 1969, Ser. No. 858,344
Int. Cl. F25b 13/00
U.S. Cl. 165—62 4 Claims

A combined heating and cooling system is provided which is particularly useful for flyers and astronauts. The system utilizes a self-contained heat source in combination with a conduit for carrying a heat transfer fluid. The conduit has first, second and third portions. A pump circulates the fluid in the conduit in a first direction, with the heat source positioned to heat the first portion of the conduit to a desired

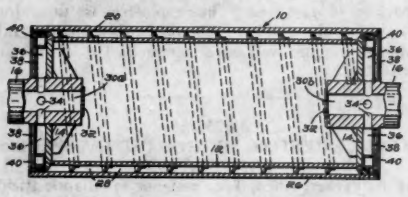
temperature. A second portion of the conduit is positioned adjacent a cooling means for cooling the fluid in the conduit and the third portion of the conduit is operatively positioned to heat or cool an object such as a flyer. Means are provided for controlling the temperature of the fluid in the third portion. Preferably the pump is actuated by a thermoelectric generator interconnected with the heat source. Preferably the means for controlling the temperature of the fluid in the third portion comprises bypass valves which permit the fluid to bypass the cooling means when desired.



3,625,280
INDUSTRIAL ROLL

Fritz Peter, Flawilerstr, Switzerland, assignor to Rodney Hunt Company, Orange, Mass.

Filed Oct. 31, 1968, Ser. No. 772,348
Int. Cl. F28d *21/04*
U.S. Cl. 165—90 **6 Claims**



An industrial roll having inner and outer cylindrical shells held in spaced concentric relationship by one or more intermediate resilient spacer elements. The spacer elements are disposed at an angle relative to a line perpendicular to the rotational axis of the roll, and provide the sole radial support for the outer shell. Axial movement as well as axial expansion and/or contraction of one shell relative to the other may if desired be opposed by spring retainers.

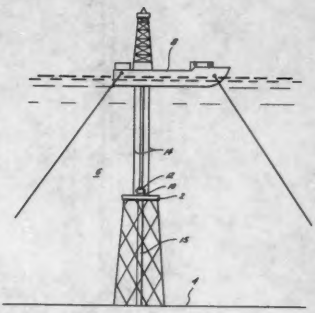
3,625,281
WELL COMPLETION METHOD AND APPARATUS

David P. Herd; Valoris L. Forsyth, and James V. Bonds, all of Houston, Tex., assignors to Rockwell Manufacturing Company, Houston, Tex.

Filed Apr. 23, 1969, Ser. No. 818,726
Int. Cl. E21b *43/01*
U.S. Cl. 166—0.6 **36 Claims**

A method and apparatus for completing an underwater well comprising the steps of: lowering hanger means and at least one tubing string on a handling string into the well casing to a position where said hanger means will be supported substantially below the mudline; cementing the tubing string within the well casing by passing cement through the handling string and the tubing string; disconnecting and removing the handling string; lowering connector means, a tubing riser and valve in the casing; and remotely connecting the connector means to the hanger means, placing the tubing string and tubing riser in fluidtight flow communication, the valve being installed in the tubing riser at a point substantially below the mudline, the tubing riser extending to the well platform.

One hanger embodiment comprises remotely operable hydraulic slip suspension means which may be activated by a remote pressure source in communication with the suspension means through a handling string and setting tool. The setting tool is provided with latches disengageable from the hanger on rotation of the handling string.

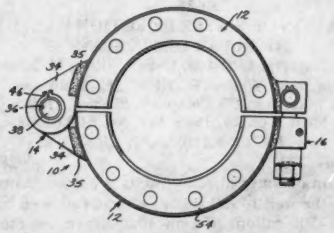


One connector means embodiment comprises remotely operable hydraulic latch means which may be activated through a tubing riser to engage the hanger means. An orientation sleeve may be provided on the connector means for aligning the tubing riser and tubing string before engagement. A conduit arrangement is shown which may be used to subsequently disconnect the connector means and riser from the hanger means for removal.

3,625,282
ADAPTIVE CONDUIT CONNECTION, PARTICULARLY FOR BRINGING BLOWING PETROLEUM WELLS UNDER CONTROL

Charles D. Bridges, and Douglas A. Miller, both of Houston, Tex., assignors to Gray Tool Company, Houston, Tex.

Filed Mar. 19, 1970, Ser. No. 21,172
Int. Cl. F21b *33/03*
U.S. Cl. 166—75 **8 Claims**

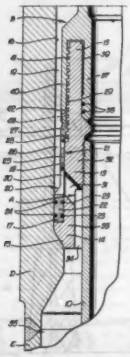


When a petroleum wellhead conduit part equipped with a clamp-receiving wedging flange and tapered sealing ring seat at one end, as shown in the U.S. Pat. of Watts et al., U.S. Pat. No. 2,766,829, issued Oct. 16, 1956, is to be connected with a part having a bolt-receiving flange, an adapter is provided which may be used for closing in a blowing well by allowing blowout control equipment such as a blowout preventer or master valve to be initially secured to the one part of the adapter, swung into place in an "open" condition and fully circumferentially secured to the adapter. The control equipment may then be closed to shut in the well. Additionally to this special use, the adapter may be used to interconnect parts whose end connectors differ in type from one another.

3,625,283
WELL BORE CASING HANGER APPARATUS

Arthur G. Ahlstone, Ventura, Calif., assignor to Vetco Offshore Industries, Inc., Ventura, Calif.

Filed May 15, 1970, Ser. No. 37,528
Int. Cl. F21b *33/03*
U.S. Cl. 166—87 **29 Claims**



A casing hanger body is threadedly connected to a running tool secured to a running string, the tool being clutched or otherwise coupled to a seal structure, which is also threadedly connected to the body, the running string being used to lower the apparatus through a body of water to engage the hanger body with a seat in an underwater wellhead housing, and to locate its seal structure between the housing and body and in an initial position in which a fluid circulation path is open, the running string and running tool being rotated to thread the tool and seal assembly simultaneously along the hanger body to release the running tool from the body and place the seal structure in a position closing the circulation path, after which the running string and running tool may be retrieved. A plurality of such casing hanger apparatus can be placed or stacked one upon the other to support different sizes of concentric casing strings in the underwater well bore, the circulation path associated with each apparatus being closed by a seal structure. A tubing hanger may be landed on the uppermost hanger apparatus and locked to the threaded portion of the uppermost hanger body.

3,625,284
STIMULATION OF WATER INJECTION WELLS WITH MICELLAR DISPERSIONS

William B. Gogarty, Littleton, Colo.; Wilson L. Kinney, Findlay, Ohio, and Walter B. Kirk, Jr., Robinson, Ill., assignors to Marathon Oil Company, Findlay, Ohio

Filed Sept. 29, 1969, Ser. No. 862,053
Int. Cl. E21b *43/22, 43/27*
U.S. Cl. 166—273 **28 Claims**

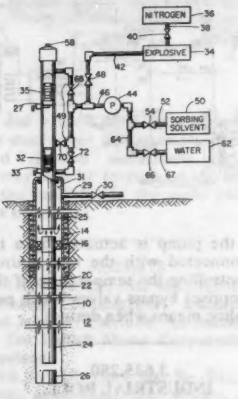
Stimulation of water injection wells is accomplished by injecting into the well 1–500 gallons of acid followed by the injection of 1–500 gallons of a micellar dispersion, the gallons of acid and dispersion based on vertical feet of oil-bearing formation. Preferably, the acid is followed by 0.5–50 volumes of water per volume of acid, i.e., a water slug is injected before the micellar solution.

3,625,285
STIMULATING WELLS WITH LIQUID EXPLOSIVES

Clarence R. Fast; George C. Howard, and Riley F. Farris, all of Tulsa, Okla., assignors to Amoco Production Company, Tulsa, Okla.

Filed Apr. 22, 1970, Ser. No. 30,751
Int. Cl. E21b *43/26*
U.S. Cl. 166—299 **15 Claims**

This is a method for increasing the permeability of underground formations adjacent a well bore by explosive fracturing. This invention relates especially to a special method of placing the liquid explosive in the well. It includes setting a plugged packer in the well just above the formation to be stimulated. A tubing string is run in the well with the lower end just above the plugged packer. The selected amount of



liquid explosive is then forced into the tubing string. After this, the tubing string is inserted in the packer and the plug of the packer is removed. The explosive is then forced downward into the well bore. The packer is replugged, tubing is removed and the well bore stemmed. The detonation is then effected.

3,625,286
WELL-CEMENTING METHOD USING A SPACER COMPOSITION

Patrick N. Parker, Allen, Tex., assignor to Atlantic Richfield Company, New York, N.Y.

Filed June 1, 1970, Ser. No. 42,459
Int. Cl. E21b *33/16*
U.S. Cl. 166—291 **6 Claims**

A spacer composition for use while cementing a well that contains an oil-base drilling fluid, the spacer containing a water-in-oil emulsion and at least one of an inorganic and organic material such as halides, hydroxides, borates, sulfates, phosphates, organic acids, and the like. A method for emplacing a cementing composition in a well bore containing an oil-base drilling fluid wherein the spacer is the composition of this invention, is employed between the drilling fluid in the well bore and the cementing composition, and is maintained there while the cementing composition is emplaced and hardened in the desired position in the well bore.

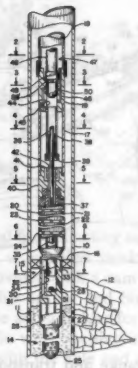
3,625,287
METHOD OF IMPROVING STRENGTH AND STABILITY OF SAND CONSOLIDATIONS MADE WITH RESIN SYSTEMS

Bill M. Young, Duncan, Okla., assignor to Halliburton Company, Duncan, Okla.

Continuation of application Ser. No. 260,826, Feb. 25, 1963, now abandoned. This application Feb. 3, 1970, Ser. No. 8,393
Int. Cl. E21b *33/138*
U.S. Cl. 166—295 **20 Claims**

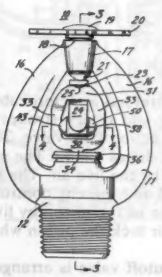
The present invention relates to the use of organosilicon compounds in sand consolidation resins used in consolidating loose sands to produce a permeable sand consolidation.

3,625,288
METHOD AND APPARATUS FOR VENTING GAS THROUGH A DOWNHOLE PUMP ASSEMBLY
George K. Roeder, P.O. Box 3931, Odessa, Tex.
Filed Apr. 14, 1970, Ser. No. 28,304
Int. Cl. F21b *43/00*; F04b *47/00*
U.S. Cl. 166—314 10 Claims



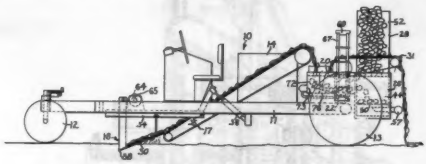
Method and apparatus for venting gas through a downhole pump assembly by producing fluid through the casing annulus, forcing power oil to the pump by either one of the tubing annulus or the innermost string, and using the one remaining flow path for the gas vent.
The pump is flow connected to the producing formation through a packer. The gas is vented through a lower hollow rod of the pump, through the pump piston and connecting rod, through the engine piston and valve control rod, where the gas continues to the surface of the earth along one of the recited flow paths.

3,625,289
SPRINKLER
Fred A. Gloeckler, Philadelphia, Pa., assignor to Star Sprinkler Corporation of Florida, Philadelphia, Pa.
Filed May 4, 1970, Ser. No. 34,184
Int. Cl. A62c *37/08*
U.S. Cl. 169—39 3 Claims



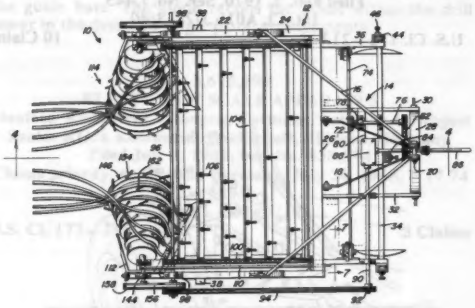
A sprinkler is provided which includes a frame, a deflector, seat closure cap, a strut and a lever bearing against the strut, which is held from seat cap release by a transversely disposed interengaged tube containing a ball and a heat-sensitive collapsible alloy element.

3,625,290
SEPARATING APPARATUS FOR MOBILE POTATO HARVESTING VEHICLE
Lynn F. Johnson, American Falls, Idaho, assignor to University of Idaho Research Foundation, Inc., Moscow, Idaho
Filed Sept. 29, 1969, Ser. No. 861,892
Int. Cl. A01d *17/00*
U.S. Cl. 171—17 6 Claims



The mobile harvesting machine has a vibrating digging means for scooping the potatoes along with foreign material (rocks, clods, vines and trash) from the ground and conveying the same to water flumes. The flumes have traps formed therein to receive the foreign materials that are heavier than the potatoes. A vine and trash conveyor remove the foreign materials that are lighter than the potatoes from the surface of the water. The potatoes flow along the flumes to a receiving tank. A conveyor removes the potatoes from the receiving tank. A recirculating pump removes the water from the tank and directs the water back to the flumes.

3,625,291
PEANUT-HARVESTING MACHINE
John R. Paulk, Pine Needle Road, Fitzgerald, Ga., and Jacob W. Paulk, Route #1, Wray, Ga.
Filed June 2, 1970, Ser. No. 42,722
Int. Cl. A01d *29/00*
U.S. Cl. 171—101 15 Claims

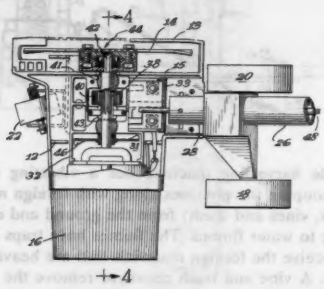


Peanut plants having taproots cut below the soil surface are transported upwardly by a conveyor in a harvesting machine to a location from which the plants are deposited onto the ground. Conical roller devices and guide rods invert the plants as they are discharged from the conveyor to windrow the plants with the taproots exposed.

3,625,292
POWER CUTTING TOOL HAVING INSULATED SLIP CLUTCH
Michael T. Lay, West Chicago, Ill., assignor to G. W. Murphy Industries, Inc.
Filed July 17, 1969, Ser. No. 842,602
Int. Cl. A01b *45/00*; F16d *7/02*
U.S. Cl. 172—13 7 Claims

A lawn edger and trimmer or the like having a shaft driven by an electric motor mounted in a casing and supplied with

electricity by a power cord. The cutting blade is mounted on the shaft by a slip clutch which also electrically insulates the blade from the shaft to prevent shock to the operator in the event of electrical malfunction of the motor or in the event the blade accidentally cuts the power cord or other source of electrical supply. The slip clutch includes an electrically insulative mass on which the blade is mounted and in which is provided an enclosed internal cavity receiving the end of the shaft. An appropriate resilient means such as a series of Bell-



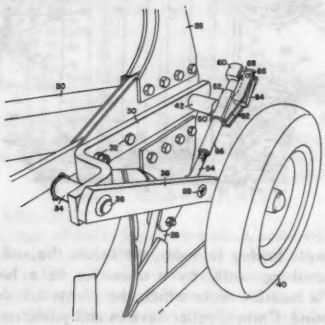
ville washer springs are mounted on the shaft and bias between an enlarged end of the shaft, e.g., a retaining and tightening nut, and a portion of the cavity wall to cause driving of the insulating mass and blade by the shaft. When an obstruction such as a rock or other hard object is struck by the blade, the spring bias of the resilient means is overcome and the shaft can continue to rotate without driving the blade. The bias of the clutch can be adjusted by means of the tightening nut.

3,625,293

GAUGE WHEEL FOR A TWO-WAY PLOW

Richard Dale Nelson, Cambridge, Ill., assignor to Deere & Company, Moline, Ill.

Filed Feb. 2, 1970, Ser. No. 7,443
Int. Cl. A01b *3/28, 3/40*
U.S. Cl. 172—212 **10 Claims**



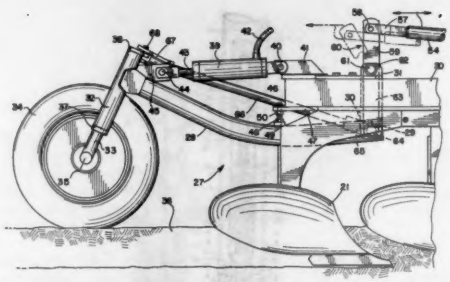
A two-way plow having alternately usable right- and left-hand plow units mounted on a frame that is selectively rotatable about a fore-and-aft axis to dispose the plow units in operating positions and a single gauge wheel that is automatically positioned when the plow is indexed to one of its alternate plowing positions to regulate the plowing depth when the plow is in either of its plowing positions. The mounting of the gauge wheel includes a single adjustment which varies the working depth of the plow for both of the plowing positions, and the adjustment can easily be made by hand without the use of tools when the plow is intermediate its alternate positions.

3,625,294

STEERABLE REAR WHEEL FOR PLOW

James Morkoski, Clarendon Hills, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Aug. 26, 1970, Ser. No. 66,948
Int. Cl. A01b *69/08*
U.S. Cl. 172—282 **9 Claims**



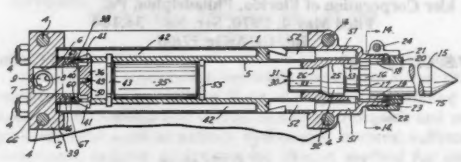
A combination gauge and transport wheel is mounted on the rear end of a plow and is carried at the end of an arm pivotally connected to the plow frame for vertical movement between operating and transport positions of the plow, the rear wheel being steered by linkage operatively connecting the wheel to the tractor hitch so that turning motion of the tractor is transmitted to the wheel without impairing its gauging function.

3,625,295

AIRHAMMER

Samuel D. Gunning, Cleveland, Ohio, assignor to Kent Air Tool Co., Kent, Ohio

Filed Feb. 12, 1970, Ser. No. 10,826
Int. Cl. B25d *9/16*
U.S. Cl. 173—15 **10 Claims**



The hammer barrel has a reciprocable power piston driven on both its power and return strokes by live air under the control of a rapid action kick valve. The piston drives a tappet which, in turn, drives a moil. The moil is held yieldably in extended position by the live air. The tappet cooperates with ducts in the barrel and thereby controls venting of the air to cause reciprocation of the piston by live air when the moil is retracted and to air lock the piston when the moil is fully extended.

A supplemental cutoff valve is arranged in the barrel and is controlled by the tappet to cut off completely the air supply to the barrel, when the hammer is idle, so as to reduce the loss of pressure air and to improve starting characteristics.

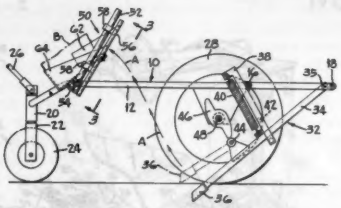
An air supply connection is arranged on the rear end of the barrel and is free from overhang laterally beyond the sides of the barrel. Accumulator ducts in the barrel store air compressed by the piston and employ it to assist in starting the piston from rest upon each reversal of stroke.

3,625,296

MECHANICAL SOIL SAMPLER

Harold E. Mabry, Greenbelt, and Donald Whittam, Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of Agriculture

Filed Dec. 30, 1969, Ser. No. 889,274
Int. Cl. G01n 1/08
U.S. Cl. 173—24 9 Claims



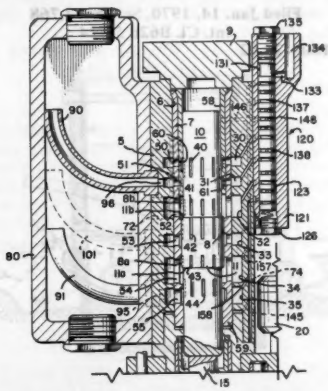
Apparatus and method for collecting subsamples of surface soil. The apparatus is a wheeled device having a spring-loaded, hinged lever provided with a cam following roller and digger foot, an adjustable spring and bumper block, a cam mounted on a wheel axle and a holder for a sample collection container having a baffle with opening and adjustable cover plate. The cam rotates with the axle and a cam lobe intermittently engages the cam follower whereupon the lever is pressed downward and the digger foot is forced into the soil. When the cam lobe disengages from the follower a spring pulls the lever rapidly upward until it strikes the bumper block. The resultant impact causes the soil sample on the digger foot to be thrown upward and forward into the sample collection container.

3,625,297

BLEED SYSTEM FOR HYDRAULICALLY ACTUATED DEVICE

Martin Worman, M.R. 12, Phillipsburg, N.J.

Filed Sept. 22, 1969, Ser. No. 859,650
Int. Cl. B25d 9/00
U.S. Cl. 173—135 4 Claims



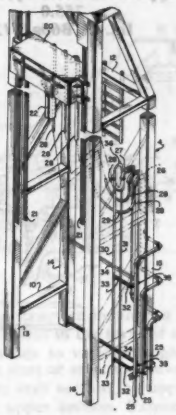
A bleed system for devices such as rock drills which are powered by hydraulic fluid. The system includes a valve which when actuated, provides communications between the various chambers in the hydraulically actuated device and a sump which is at atmospheric pressure. After a long period of shutdown the valve is opened to bleed off any air which may be in the hydraulic system.

3,625,298

GUIDE FOR PRESSURE HOSES

Laszlo Gyongyosi, 137 Grove Ave., Clarksburg, W. Va.

Filed Nov. 28, 1969, Ser. No. 880,848
Int. Cl. E21c 1/10
U.S. Cl. 173—163 5 Claims



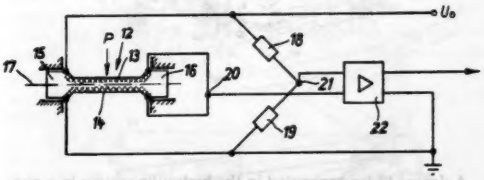
A guide for pressure hoses for use with a machine such as a rock drill machine wherein there is a drill tower and a rotary head movable along the longitudinal axis of the drill tower. The pressure hoses are located within the drill tower in a single vertical plane and have a loop formed therein. A guide including a pair of parallel, spaced-apart guide bars is mounted within the drill tower. The bars are interconnected by a plurality of U-shaped members. The pressure hoses for supplying fluid under pressure to the rotary head fit between the parallel guide bars. As the rotary head moves up and down the tower, the loop formed in the hoses rolls between the guide bars. The guide retains the hoses within the drill tower in the designed single plane arrangements.

3,625,299

ELECTRONIC SCALE APPARATUS

Manfred Kammerer, Ebingen, Germany, assignor to August Sauter KG. a Kommanditgesellschaft, Ebingen, Germany

Filed July 3, 1969, Ser. No. 838,894
Claims priority, application Germany, July 24, 1968, P 17 74 599.2
Int. Cl. G01g 3/14
U.S. Cl. 177—211 3 Claims



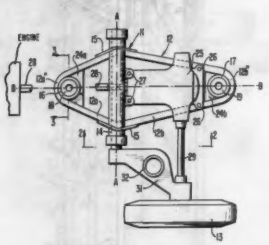
An electronic scale apparatus comprising a member capable of undergoing deformations resulting in changes of the inner mechanical tensions thereof upon the application of a force thereto and consequently undergoing a change of the electrical resistance thereof, a bridge circuit connected to include such member to develop a signal according to the change of the electrical resistance of such member, and output means producing an indication of the force in response to the signal.

3,625,300

SUSPENSION OF AN AXLE UNIT IN MOTOR VEHICLES BY MEANS OF A SUPPORT MEMBER

Bela Barenyi, Maichingen, Wurttemberg, and Karl Wilfert, Gerlingen-Waldstadt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Untertuerkheim, Germany

Filed Aug. 21, 1969, Ser. No. 3,263
Claims priority, application Germany, Aug. 21, 1968, P 17 80 255.0
Int. Cl. B60g *3/12*
U.S. Cl. 180—73 32 Claims



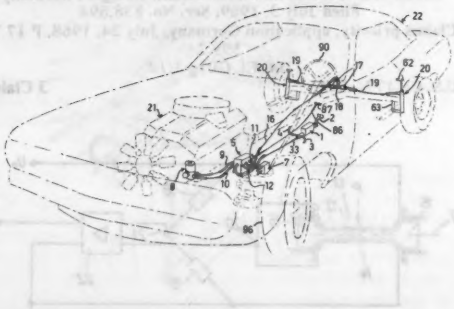
A suspension for an axle unit in motor vehicles by means of a support structure which enables a pivoting of a wheel pair in relation to the vehicle superstructure about two mutually perpendicular directions; the support structure is formed by an approximately annularly shaped support frame which is elastically connected in one of the axial directions at least at one end, but preferably at both ends thereof at the superstructure.

3,625,301

POWER STABILIZER AND METHOD

Jack F. Joyslen, Concord, Calif., assignor to Gerhard W. Stiefvater, Chico, Calif.

Filed May 11, 1970, Ser. No. 36,136
Int. Cl. B60g *21/10*
U.S. Cl. 180—79.2 R 11 Claims



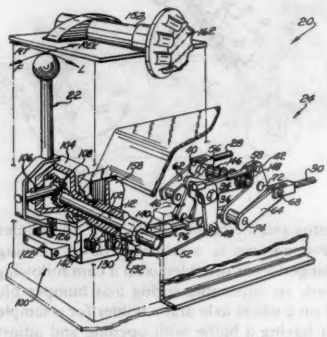
A device to be connected in the hydraulic system in a conventional vehicle that includes a body-supporting chassis sprung on wheel-mounted running gear, which device includes relatively movable elements connecting the chassis and running gear adjacent to each of the ground wheels automatically hydraulically actuatable for restricting unsafe movements of the chassis and body relative to the running gear during either straight away movement of the vehicle over the ground, or around curves during normal or abnormal operation of the vehicle and application of the brakes, and which device also performs the function of shock absorbers.

3,625,302

HYDROSTATIC TRANSMISSION CONTROL

Robert B. Lauck, Southfield, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio

Filed May 12, 1969, Ser. No. 823,787
Int. Cl. B62d *11/04*
U.S. Cl. 180—6.48 31 Claims



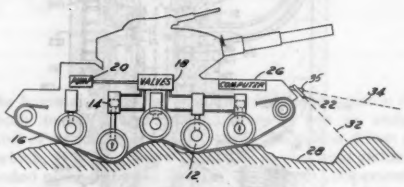
An improved apparatus for controlling the operation of a plurality of hydrostatic transmissions includes a single-control member. The control member is connected with the hydrostatic transmissions by a mechanical linkage which enables the control member to be moved in a natural manner to control both forward and reverse movement of a vehicle driven by the hydrostatic transmissions. The mechanical linkage can be used with different types of control members, such as a joystick or a T-handle.

3,625,303

TERRAIN PROFILER AND PASSIVE MICROWAVE SENSOR FOR CONTROLLING VEHICLE SUSPENSION

John W. Cameron, Rochester, Mich., assignor to The United States of America as represented by the Secretary of the Army

Filed Jan. 14, 1970, Ser. No. 2,768
Int. Cl. B62d *55/14*
U.S. Cl. 180—24.02 4 Claims

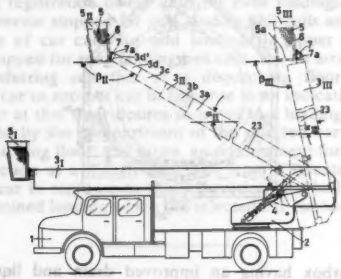


A terrain profiler comprising the combination of a laser ranger, a rocking mirror, and a passive microwave sensor for simultaneously automatically controlling vehicle suspension. The device provides means for allowing high speed over irregular terrain by providing a short range laser profiler to control the active suspension of a vehicle automatically and a passive microwave sensor for sensing the crushability of obstacles by disclosing the nature and moisture content of the soil and the nature of the subsoil material.

3,625,304
MOBILE SWIVEL LADDER

Willi Siefermann, deceased, late of Karlsruhe by Luise Siefermann, nee Gaugler, Bussardweg 49, Karlsruhe; Dorothea Siefermann, Bussardweg 49, Karlsruhe, and Hans Siefermann, Kreuzstr. 12, Forchheim near Karlsruhe, all heirs, all of Germany

Claims priority, application Germany, Mar. 14, 1968, P 17 08 078.3
Int. Cl. E06c *5/04*; B66f *11/04*
U.S. Cl. 182—2 19 Claims

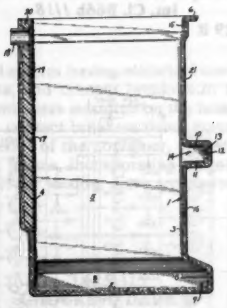


A rescue mobile ladder comprising a ladder pivotally connected at one end to a vehicle and a cage pivotally suspended on the second end of said ladder so that under the action of gravity, said cage adapts itself automatically to any change in the incline of the ladder relative to the horizontal position.

3,625,305
TRANSPORT BASKET AND METHOD OF PRODUCING THE SAME

Otto M. Mueller, and Melvin R. Nordin, both of Lakeville, Minn., assignors to Viking Engineering and Manufacturing, Inc., Lakeville, Minn.

Filed June 2, 1969, Ser. No. 829,489
Int. Cl. B65d *1/48*; E04g *5/08*
U.S. Cl. 182—46 2 Claims

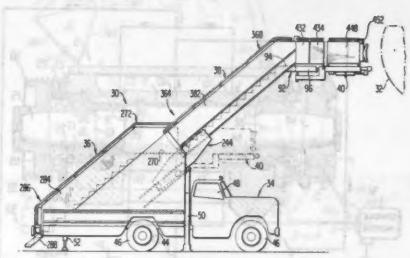


A transport basket for raising personnel or material to elevated positions from a vehicle having an elevatable basket supporting structure thereon. The basket comprises a liner of electrical insulating material and an outer rigid jacket covering the exterior surface of the liner. A method of producing the transport basket involves molding the liner in a rotational mold without a core, removing the liner from the mold, and thereafter covering the exterior surface of the liner with glass fiber-impregnated plastic resin.

3,625,306
CONVEYANCE SERVICING STRUCTURE

James F. Sauer, and Leonzo V. Glidewell, both of Miami, Fla., assignors to Wollard Aircraft Equipment, Inc.

Filed July 16, 1970, Ser. No. 55,456
Int. Cl. E06c *5/06*
U.S. Cl. 182—63 13 Claims

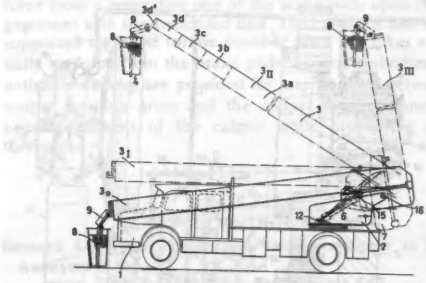


Conveyance servicing structure includes a truck-mounted, extensible ramp arrangement in the form of a stair assembly. The stair assembly extends to various heights for servicing conveyances of various sizes or at various levels. The stair assembly includes a lower stair section, an upper stair section, and a carriage for the upper section. Extension of the stair assembly is effected by linearly extensible power means which move the carriage relative to the lower stair section, and which move the upper stair section relative to the carriage. When retracted, the upper stair section underlies the lower stair section and, when extended, the lower end portion of the upper section is contiguous to the upper end portion of the lower section to define a continuous stairway. The stair assembly can be locked in increments of one riser height, so that all the steps of the stair assembly are of uniform height.

3,625,307
MOBILE SWIVEL LADDER

Willi Siefermann, deceased, late of Bussardweg 49, Karlsruhe, Germany (by Luise Siefermann, nee Gaugler, executrix); Dorothea Siefermann, Bussardweg 49, Karlsruhe, and Hans Siefermann, Kreuzstr. 12, Forchheim near Karlsruhe, both of Germany

Filed Mar. 10, 1969, Ser. No. 812,540
Claims priority, application Germany, Mar. 14, 1968, P 17 08 079.4
Int. Cl. E06c *5/06*; B66f *11/04*
U.S. Cl. 182—66 12 Claims



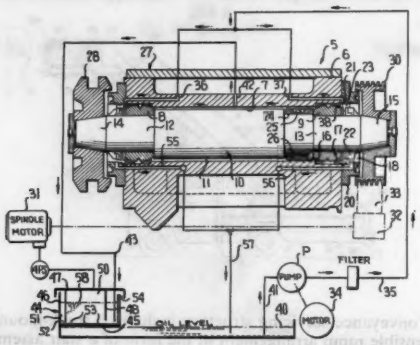
A rescue mobile ladder comprising a ladder pivotally connected at one end to a vehicle and a cage pivotally suspended on the second end of the said ladder so that under the action of gravity, said cage adapts itself automatically to any change in the incline of the ladder relative to the horizontal position.

3,625,308

SPINDLE LUBRICATION SAFETY DEVICE

Kurt M. Gebel, Waynesboro, Pa., assignor to Litton Industries, Inc., Beverly Hills, Calif.

Filed Aug. 21, 1969, Ser. No. 851,890
Int. Cl. F16n *29/00*
U.S. Cl. 184—6.1 **11 Claims**



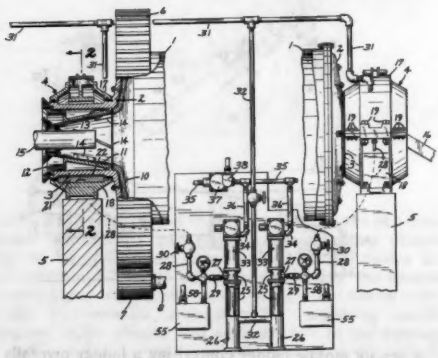
Lubrication of spindle bearings, and more particularly to safety means for preventing the starting of the spindle drive motor before there is assurance of adequate lubrication for the spindle bearings. It is necessary that lubricant in the spindle housing be adequate before the spindle drive motor can start. This is accomplished by providing a pressure chamber in which the rise in lubricant level confines a small volume of air. When the lubricant level rises to a predetermined point, the air is subjected to compression sufficient to actuate a pressure switch in the circuit to the spindle drive motor. The compression chamber may either be part of an external lubricating system, or may be an integral part of the spindle housing. When the machine of which the spindle is a part is stopped, lubricant drains out of the spindle housing and the lubricant level within the compression chamber is reduced to permit the pressure switch to open.

3,625,309

AUTOMATIC JOURNAL LIFT APPARATUS FOR GRINDING MILLS

Clifford E. Lovold, Two Harbors, Minn., assignor to Reserve Mining Company, Silver Bay, Minn.

Filed Mar. 23, 1970, Ser. No. 21,577
Int. Cl. F16c *33/66*
U.S. Cl. 184—6.3 **6 Claims**



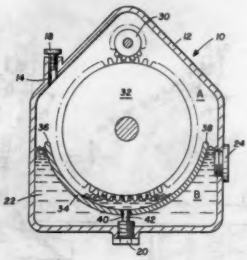
Apparatus for lifting journals of heavy rotary equipment away from metal to metal contact with underlying bearing portions and simultaneously lubricating the journals prior to imparting rotary movement to the rotary equipment.

3,625,310

GEARBOX LUBRICATION

David B. Herrick, Connersville, Ind., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Jan. 20, 1970, Ser. No. 4,376
Int. Cl. F16n *7/26*
U.S. Cl. 184—6.12 **5 Claims**



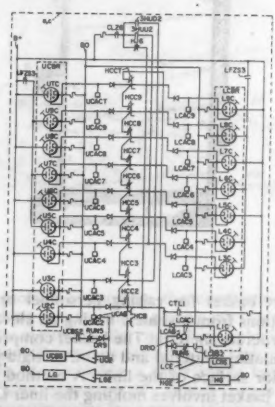
A gearbox having an improved drain and liquid level equalizing arrangement therein. The gearbox includes a housing having meshing gears mounted therein and containing a liquid for lubricating and cooling the gears. A drain opening extends through the lower side of the housing and is threaded to receive a drain plug. A baffle is positioned in the housing and has a port therein in alignment with the drain opening. The drain plug has an extension thereon that projects, in one position, into the port in the baffle. The extension of the drain plug is provided with a passageway whereby fluid can flow from within the baffle into the housing therein below. The drain plug can be moved to a second position wherein the extension on the drain plug is removed from the port permitting rapid fluid communication between the interior of the baffle and the housing therein below when it is desired to accurately determine the level of the liquid in the gearbox.

3,625,311

CONTROLS FOR MULTICOMPARTMENT ELEVATORS

Frederick Henry Nowak, New Fairfield, Conn., and Henry Joseph Pasternak, Parlin, N.J., assignors to Otis Elevator Company, New York, N.Y.

Filed Apr. 21, 1970, Ser. No. 30,408
Int. Cl. B66b *1/18*
U.S. Cl. 187—29 R **51 Claims**



Controls for multicompartment elevator cars including, one, an arrangement operating while a car is parked and in

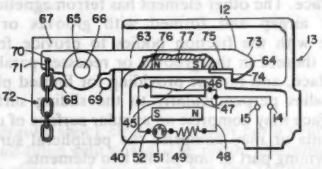
response to the answering of a hall call for one direction of travel by one compartment to delay for at least a predetermined period the answering of a hall call for the other direction by the other compartment; two, an arrangement for preventing under certain circumstances the registration of certain car calls in each of the compartments of a car; three, an arrangement in which two separate hall call registration devices are provided at a predetermined intermediate landing for indicating desired travel in a particular direction from that landing, one for travel to odd landings in that direction and the other for travel to even landings; four, an arrangement for stopping some of a plurality of two compartment cars with their lower compartments for odd landing hall calls and the rest of the cars with their upper compartments for even landing hall calls; five, an arrangement for preventing both the registration of car calls for even landings in lower compartments stopped for odd landing hall calls and the registration of car calls for odd landings in upper compartments stopped for even landing hall calls; six, an arrangement for transferring selection at a dispatching floor from a selected car to another car in response to an indication that a passenger at that floor desires to travel to a landing which is not served by the compartment of the selected car adjacent the dispatching floor; and seven, an arrangement for transferring selection at a dispatching floor from a selected car to another car in response to the registration of a hall call at a predetermined landing which the selected car cannot answer.

3,625,312

SAFETY APPARATUS FOR LANDING GATES ON HOIST ELEVATORS

Murray Hutner, 562 Briar Hill Ave., Toronto, Ontario, Canada

Filed June 9, 1969, Ser. No. 831,335
Int. Cl. B66b *1/00*
U.S. Cl. 187—48 **12 Claims**



A hoist control system having electrical control circuits for each landing gate, and contact breakers in the control circuits in sealed containers mounted on the hoist adjacent each landing gate, the contact breakers being magnetically operable from the exterior of the container, and mechanical landing gate latching means, incorporating magnets which close the contacts when the landing gates are closed and mechanically latched.

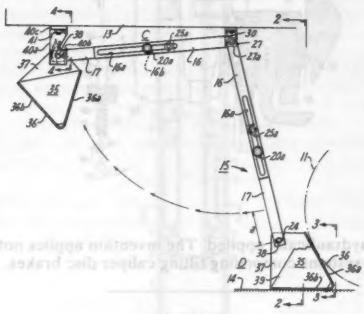
3,625,313

CHOCKING DEVICE

Walter B. Lowrie, 104 Newkirk Drive, Glenshaw, Pa.

Filed Oct. 17, 1969, Ser. No. 867,121
Int. Cl. B60t *3/00*
U.S. Cl. 188—4 R **9 Claims**

A pair of wheel blocking or chocking devices is operatively positioned in an opposed relation for cooperatively engaging opposite sides of the tire of a rear wheel of a heavy wheeled vehicle, such as a truck or trailer, for positively retaining the vehicle at a desired location and, particularly, when loading or unloading or when parking. Each chocking device is manually reducible in length and radially swingable from an extended "down" or operating position to a shortened, securely retained, upper, underframe latched position when not in use; it is strong but light in weight for easy manual manipulation.

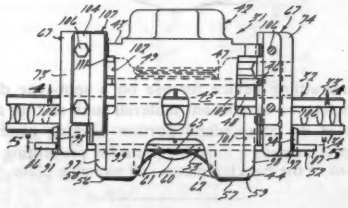


3,625,314

SLIDING CALIPER-TYPE DISK BRAKE

Kurt H. Rinker, Wayne, Mich., assignor to Kelsey-Hayes Company

Filed June 26, 1969, Ser. No. 836,794
Int. Cl. F16d *55/18*
U.S. Cl. 188—72.4 **14 Claims**



A sliding caliper-type disk brake embodying a torque member having a pair of spaced arms each of which takes the force from a respective one of the brake pads upon their engagement with the associated disk. The caliper is also slidably supported upon the torque member arms but takes substantially no force from the brake pads. Several embodiments of antirattle devices are provided for interposition between the torque member arms and the caliper for accommodating some movement of the caliper while precluding rattling thereof.

3,625,315

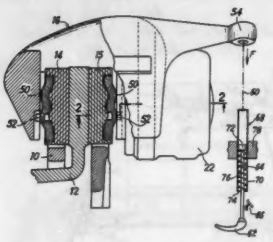
BRAKING CONTROL MEANS

Bernard Laverdant, Vincennes, France, assignor to Societe Anonyme D.B.A.

Filed Oct. 15, 1969, Ser. No. 866,542
Claims priority, application France, Oct. 23, 1968, 170938
Int. Cl. F16d *55/18*
U.S. Cl. 188—72.6 **5 Claims**

In an emergency and parking mechanical control braking system there is inserted a heavy resilient means between the control lever or pedal and the mechanical braking

mechanism of the brakes. Such resilient means is used to store energy restituted to apply the brakes when they are no longer hydraulically applied. The invention applies notably to braking systems comprising tilting caliper disc brakes.



3,625,316

ANTIRATTLING DEVICE OF DISC BRAKE

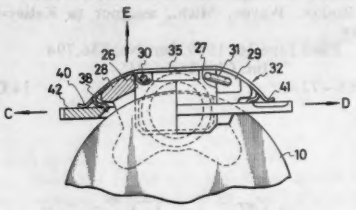
Yoshinori Mori, Toyota, Japan, assignor to Aisin Seiki Kabushiki Kaisha, Kariya Aichi Pref., Japan

Filed Feb. 9, 1970, Ser. No. 9,729

Claims priority, application Japan, Feb. 21, 1969, 44/15734

Int. Cl. F16d *65/02*

U.S. Cl. 188—73.5 **6 Claims**



An antirattling device for use on a spot-type disc brake which is formed of resilient material such as thin metal and engages at its intermediate portion backing plates guiding pins and at its ends a movable plate for preventing excessive vibrations of the backing plates and movable plate.

3,625,317

MAGNETIC BRAKE SYSTEM

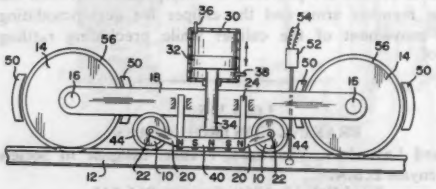
Max Baermann, 506 Bensberg Bezirk, Cologne, Germany

Filed June 24, 1969, Ser. No. 836,033

Claims priority, application Germany, June 27, 1968, P 17 55 827.9

Int. Cl. F16d *65/34;* **H02k** *49/04*

U.S. Cl. 188—165 **5 Claims**



A magnetic brake system for vehicles, comprising an eddy current brake having a stator and a rotor. The stator is fixed with respect to the vehicle and the rotor is arranged to be driven by a member which moves relative to the vehicle. Means are provided for bringing the rotor into driven relationship with the movable member, whereby upon the energization of the eddy current brake, a braking effect is imparted to the vehicle.

3,625,318

FRICTION BRAKE

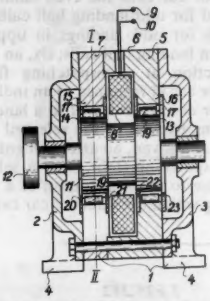
Hans Heinrich Wymann, Munchenbuchsee, Switzerland, assignor to Maschinenfabrik Winkler, Fallert & Co. AG, Bern, Switzerland

Filed Nov. 5, 1969, Ser. No. 874,228

Claims priority, application Sweden, Nov. 8, 1968, 15206/68

Int. Cl. F16d *65/34*

U.S. Cl. 188—164 **17 Claims**



An electromagnetically operated friction brake includes a stator element, a rotor element and a magnetizing winding producing at least one magnetic field extending through both the stator element and the rotor element, the two elements defining at least one air gap therebetween. One of the elements is formed with a smooth sliding surface at an airgap, and a plurality of ferromagnetic friction bodies, such as balls, or cubes, are arranged in the airgap for movement along the sliding surface. The other element has ferromagnetic portions facing the airgap and formed with grooves or recesses cooperable with the friction bodies to provide for limited movement thereof in the grooves or recesses parallel to the sliding surface, and further providing for limited play of the friction bodies perpendicularly to the sliding surface. The sliding surface may comprise an annular surface of one of the two elements or may comprise the peripheral surface of a cylinder forming part of one of the two elements.

3,625,319

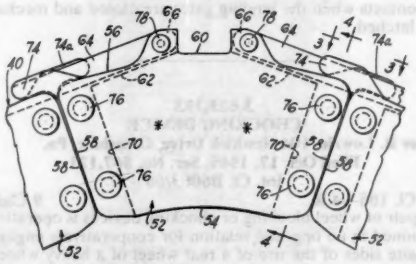
DISC ELEMENT CONSTRUCTION FOR DISC BRAKE

Walter J. Krause, South Bend, Ind., assignor to The Bendix Corporation

Filed Aug. 19, 1969, Ser. No. 851,287

Int. Cl. F16d *65/12*

U.S. Cl. 188—218 XL **6 Claims**



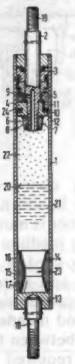
The following relates to a friction disc element construction for a disc brake which includes a pair of laminations

formed of a plurality of interconnected annularly arranged segments wherein the interconnection includes a plurality of circumferential link members. All of the segments of both laminations are symmetrically alike, but the segments of one lamination are allochirally arranged with respect to the segments of the other lamination. Each segment includes an integral protruberance extending therefrom which overlaps and contacts the next adjacent segment along the radially outer edge thereof.

3,625,320
PNEUDRAULIC SHOCK ABSORBER

Peter Doetsch, Altdrossenfeld, and Wilfried F. Roos, Bayreuth, both of Germany, assignors to Stabilus Industrie-Und Handelsgesellschaft MBH, Kobleng-Neuendorf, Germany

Filed July 31, 1969, Ser. No. 846,391
Claims priority, application Germany, Aug. 8, 1968, P 17 75 416.4
Int. Cl. F16d *69/00*
U.S. Cl. 188—269 **6 Claims**



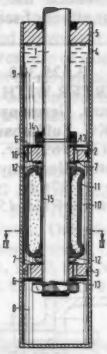
A pneudraulic shock strut for aircraft has a cylinder which is about half-filled with liquid. The piston assembly which includes the piston and piston rod has two throttling bores of which one has an inlet orifice in a plunger projecting from the piston face directed away from the piston rod and approximately conformingly engageable with a central bore in a resilient ring mounted near an end wall of the cylinder. The outlet orifice of the bore is directed radially from the piston rod. The inlet orifice of the second conduit is axially offset from the first inlet orifice in the annular piston face about the plunger and its outlet is axially directed. The second conduit is closed by the ring when the piston approaches the end of its stroke.

3,625,321
SHOCK ABSORBER AND FLUID-COMPENSATING MEANS

Dieter Lutz, Schweinfurt am Main, Germany, assignor to Fichtel & Sachs AG., Schweinfurt am Main, Germany

Filed Aug. 26, 1969, Ser. No. 853,105
Claims priority, application Germany, Sept. 6, 1968, P 17 75 663.7
Int. Cl. F16f *9/08*
U.S. Cl. 188—298 **6 Claims**

In a shock absorber having a cylinder and two axially spaced pistons on the same piston rod, a tubular membrane attached to the piston rod between the pistons is filled with compressed gas to compensate for the changes in the cylinder volume available to a liquid when the piston rod moves into and out of the cylinder cavity. In a modified arrangement, the compensating chamber is mounted on the piston rod outside the cylinder behind a flexible membrane

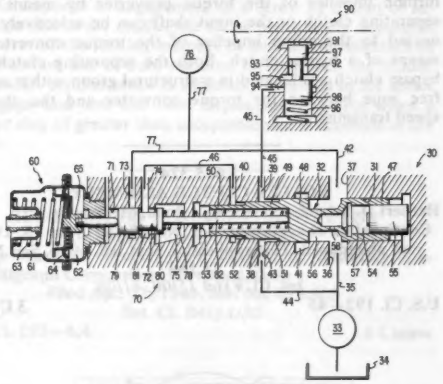


to which the liquid in the central cylinder compartment has access through a bore in the piston rod.

3,625,322
FRICTION COUPLING CONTROLLED BY VEHICLE SPEED AND MANIFOLD VACUUM

Hiroaki Nagamatsu; Katsuhiro Handa, and Tetsuo Shimosaki, all of Hiroshima, Japan, assignors to Toyo Kogyo Co., Ltd., Hiroshima, Japan

Filed Oct. 30, 1969, Ser. No. 872,631
Claims priority, application Japan, Oct. 30, 1968, Oct. 31, 1968, Oct. 31, 1968; 43/79417, 43/79790, 43/95252
Int. Cl. F16d *25/00, 43/284*
U.S. Cl. 192—.032 **5 Claims**



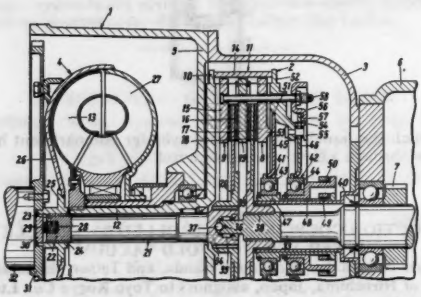
The control system for an automatic transmission controls the flow of fluid to a friction clutch or brake to establish various drive gear ratios of a transmission including a friction-engaging mechanism to complete a power train between said shafts. A source of fluid for supplying a line pressure to said friction-engaging mechanism is provided. A vacuum motor is connected to the intake manifold of an engine. A regulator valve is disposed between the source of fluid and the friction-engaging mechanism to regulate the line pressure from the source. Valve means connected to said vacuum motor increase the line pressure in response to the decrease of the vacuum in the intake manifold by contacting with the regulator valve when said vacuum is below a predetermined value to hold the line pressure higher than the minimum value. When said vacuum is above a predetermined value, said value means releases itself from the regulator valve and at the same time communicates line pressure to a valve land area on the regulator valve to increase the force acting on

said regulator valve and hold the line pressure higher than the minumum valve. A pressure area of the regulator valve is coupled to the source of fluid through a restriction, and a speed-responsive device connects the pressure area to a sump or exhaust to reduce the line pressure above a predetermined speed for either of said shafts.

3,625,323
TORQUE CONVERTER WITH DUAL CLUTCHES

Richard Hetmann, Tamm, Germany, assignor to Firma Dr.-Ing. h. c. F. Porsche KG, Zuffenhausen, Germany

Filed Aug. 12, 1969, Ser. No. 849,388
Claims priority, application Germany, Aug. 24, 1968, P 17 80 276.5
Int. Cl. F16h *45/02*
U.S. Cl. 192—3.26 **10 Claims**

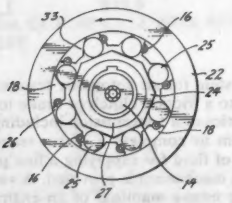


A clutch assembly for compound transmissions including a hydrodynamic torque converter and a change-speed gear. The gear input shaft can be selectively connected with the turbine impeller of the torque converter by means of a separating clutch or the input shaft can be selectively connected to the pump impeller of the torque converter by means of a bypass clutch. Both the separating clutch and bypass clutch are located in a structural group within an oil-free zone between the torque converter and the change-speed transmission.

3,625,324
ROLLER CLUTCH ASSEMBLY

Herbert D. Scharf, 437 Merwyn Road, Merion, Pa.

Continuation of application Ser. No. 47,465, June 18, 1970, now abandoned. This application Sept. 10, 1970, Ser. No. 71,164
Int. Cl. F16d *15/00, 41/06*
U.S. Cl. 192—45 **3 Claims**

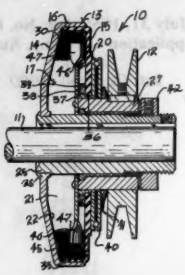


In a roller clutch assembly including the conventional crankshaft-cam-flywheel arrangement wherein rotation of the flywheel ring may be transmitted to the cam through engaged drive rollers, the improvement comprising forming slots in the cage retainer walls to receive flexible tubing for each drive roller, whereby when the roller clutch is brought to the actuated position each drive roller will be in resilient contact with its corresponding piece of tubing such that rotation is transmitted from the flywheel ring to the cam through all of the drive rollers, and wherein in disengaged position the cage retainer wall, through direct contact between the tubing and each individual roller urges the rollers against the next retainer arcuate wall and away from the rotating ring.

3,625,325
VARIABLE-TORQUE CENTRIFUGAL FRICTION CLUTCH

Richard A. Hersey, 1809 James Ave. South, Minneapolis, Minn.

Filed Feb. 2, 1970, Ser. No. 7,542
Int. Cl. F16d *31/08, 37/00*
U.S. Cl. 192—58 A **8 Claims**

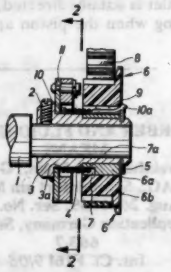


A rotatable housing connected to a driving member defines a circular cavity in which a circular clutch plate connected to a driven member is mounted for rotation relative to the housing, a clutching medium in the cavity having a fluid state moves radially toward a restricted annular passage defined by the housing and clutch plate responsive to rotation of the housing to cause common rotation of the drive and driven members, and means is provided to impart relative movements axially between the housing and clutch plate for varying the torque required to cause relative rotational movement between the housing and clutch plate.

3,625,326
CENTRIFUGALLY CONTROLLED LOOP SPRING CLUTCH

Albert Rix, Wilhelmshaven, and Georg Werner, Heidmuhle, both of Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany

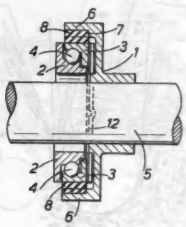
Filed Mar. 3, 1970, Ser. No. 15,990
Claims priority, application Germany, Mar. 3, 1969, P 19 10 663.9
Int. Cl. F16d *43/24*
U.S. Cl. 192—105 CE **9 Claims**



A centrifugally controlled loop spring clutch for coupling and decoupling a drive shaft to a coaxial member. The drive shaft is provided with a pair of centrifugally responsive weight members which are mounted so that they pivot in op-

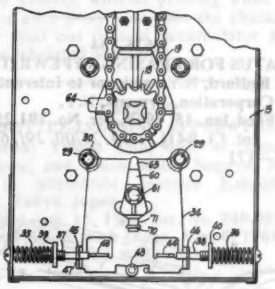
posite directions about their pivot axes, and are coupled for movement together. Movement of the weight members causes a loop spring mounted on the coaxial member and encircling the end of the drive shaft, to be pressed against the periphery of the drive shaft to thereby couple the drive shaft to the coaxial member. The oppositely acting arrangement of the centrifugal weight members permits the forces caused by tangential accelerations due to torsional vibrations to be compensated and a smooth coupling and decoupling action to take place.

3,625,327
CLUTCH CONTROL BEARINGS
Harold Donald Birdsey, Newark, England, assignor to Ransome & Morles Bearing Co. Ltd.
Filed Feb. 3, 1970, Ser. No. 8,226
Claims priority, application Great Britain, Feb. 3, 1969, 5,658/69
Int. Cl. F16d *13/60*
U.S. Cl. 192—110 B **11 Claims**



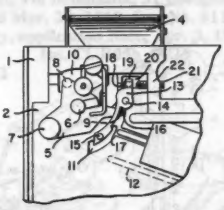
A clutch control bearing wherein adjustment to compensate for eccentricity with respect to a shaft is accomplished by a resilient mounting interposed between a raceway and a hub plate. A wobble plate may be employed to permit further adjustment relative to the shaft.

3,625,328
DUAL-RESPONSE DRIVE TRAIN
Alvin J. Carli, Sebring, Ohio, assignor to The Alliance Manufacturing Company, Inc.
Filed Dec. 18, 1969, Ser. No. 886,175
Int. Cl. F16d *71/00*
U.S. Cl. 192—142 R **18 Claims**



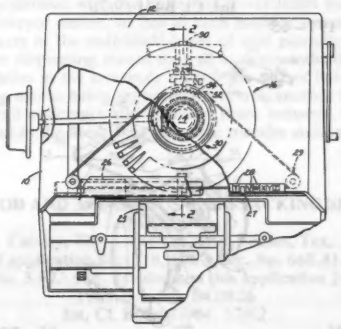
A planetary drive train is disclosed having a first input from an electric motor and a first output which is connected to drive a load. A second output from the drive train is partially rotatable and is connected to actuate a control switch whenever the torque requirements of the load exceed a first predetermined limit established by an adjustable screw and a yieldable spring. When this predetermined limit is exceeded the spring is stressed to permit partial rotation of the planetary drive second output and this actuates the switch to deenergize the motor. Additionally, the planetary drive first output driving the load is connected so that movement of the load between first and second limits actuates the switch to deenergize the motor. The load may be a garage door moved between upward and downward limit positions, and the drive train second output may be a limiting torque condition to deenergize the drive motor whenever the garage door exceeds first and second predetermined force requirements in moving in the upward and downward directions. The foregoing abstract is merely a resume of one general application, is not a complete discussion of all principles of operation or applications, and is not to be construed as a limitation on the scope of the claimed subject matter.

3,625,329
CRADLE LOCKING ARRANGEMENT FOR COIN SORTER
Wilson M. Stewart, Ottawa, Ontario, Canada, assignor to Vendall Machines Limited, Ottawa, Ontario, Canada
Filed Aug. 21, 1969, Ser. No. 851,932
Int. Cl. G07f *3/02*
U.S. Cl. 194—102 **3 Claims**



In a coin shorter having a cradle adapted to be rocked by a coin of predetermined size, there is provided a locking member for locking the cradle against full rocking movement by a coin of smaller size, said locking member being pivotally mounted intermediate its ends and having a shoulder biassed into the path of a pin on the cradle but movable out of said path in response to engagement of a screw by a coin of acceptable size in the cradle, the screw being finely adjustable in an arm of the locking member to enable fine selection of the minimum size of coin required to fully rock the cradle. Preferably, another screw is adjustably mounted in the sorter to engage said arm and limit displacement thereof when a coin or slug of greater than acceptable size is received in the sorter.

3,625,330
REGISTRATION ALIGNMENT DEVICE FOR EMBOSSING MACHINE
George Marinoff, Mentor, Ohio, assignor to Addressograph-Multigraph Corporation, Cleveland, Ohio
Filed Apr. 21, 1969, Ser. No. 818,005
Int. Cl. B41j *1/30*
U.S. Cl. 197—6.4 **8 Claims**



A registration device of the rack-and-pawl type designed to accurately position the rack in the event said rack is misaligned with the pawl member.

A circular rack carries a device that must be accurately positioned but because of the speed at which it rotates a detent mechanism is objectionable.

The pawl assembly consists of a sensing pawl pivotally mounted to an engaging pawl and arranged slightly out of alignment and in advance of the engaging pawl. If the rack is stopped in a position where a tooth on the rack is in line with the tooth of the engaging pawl the sensing pawl will rotate the rack slightly to prevent tooth-on-tooth damage.

3,625,331

TYPE HEAD POSITIONING APPARATUS

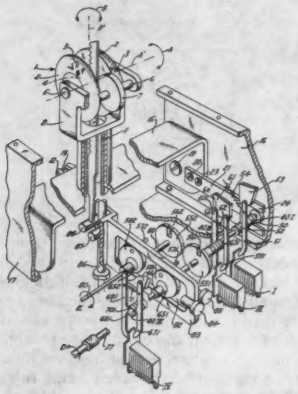
Hermann Waldenburger, Wolkersdorf, and Herbert Decker, Lauf, both of Germany, assignors to Triumph Werke Nurnberg AG, Nurnberg, Germany

Filed June 17, 1969, Ser. No. 834,017

Claims priority, application Germany, June 10, 1968, P 17 61 660.3

Int. Cl. B41j *1/60*

U.S. Cl. 197—48 **11 Claims**



The type head of a typewriter or like business machine is turned about perpendicular axes by two incremental links in order to place a character selected by actuation of a key, in a printing position. Each incremental link is placed in a plurality of angular positions by two eccentric means which are coupled or disengaged from two drive shafts under the control of electromagnetic means energized by key switches.

3,625,332

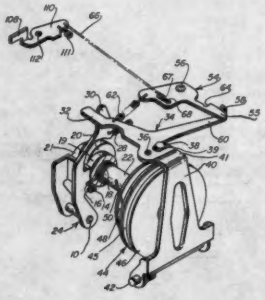
QUIET REPEAT-LINE-INDEXING MECHANISM

Robert E. McGrath, 102 West St., Rocky Hill, Conn.

Continuation of application Ser. No. 690,488, Dec. 14, 1967, now abandoned. This application Apr. 20, 1970, Ser. No. 28,265

Int. Cl. B41j *19/70*

U.S. Cl. 197—65 **6 Claims**



In a typewriter in which a frame-based power mechanism is responsive to a carriage return key to operate a carriage-supported line-indexing mechanism and then to draw the carriage in return direction by a limitedly movable cushioning counterstop means, provision is made so that then the said power mechanism under key control will intermittently effect line indexing operations and furthermore said counterstop means during said intermittent operations is blocked against movement to prevent carriage movement.

3,625,333

FRONT-FEEDING DEVICE FOR ACCOUNTING OR OTHER SUCH MACHINES

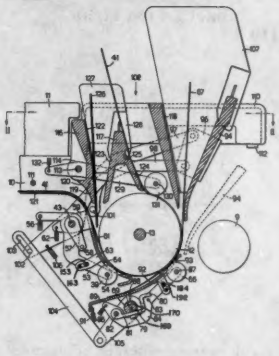
Alessandro Cortona, Banchette, Turin, and Bruno Sandrone, Ivera, Turin, both of Italy, assignors to Ing. C. Olivetti & C., S.p.A., Ivera, Turin, Italy

Filed Feb. 27, 1969, Ser. No. 802,831

Claims priority, application Italy, Mar. 2, 1968, 50,743/68

Int. Cl. B41j *11/48*

U.S. Cl. 197—128 **4 Claims**



Feed apparatus for printing machines providing both front and back feed in which a pivotal guide frame mounted over the printing platen has a plurality of longitudinal guide surfaces for guiding front and back fed sheets separately, a pivotally supported guide rule parallel to said frame providing a front-most guide surface, lateral adjustable guides mounted on said frame and said rule, front and rear bottom guides positioned below the printing platen together with respective paper-pressing rollers, a plurality of interengaged levers for effectuating release of a plurality of said guides simultaneously for insertion of sheet material and cam-operated clutch means for releasing the printing platen for free manual rotation during the insertion of material.

3,625,334

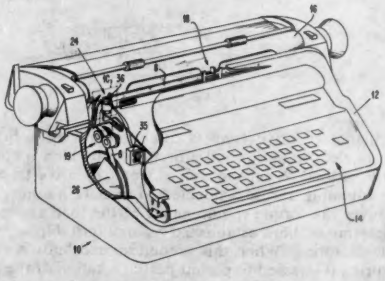
APPARATUS FOR ERASING TYPEWRITER TAPE

Kie Y. Ahn, Bedford, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1969, Ser. No. 791,256

Int. Cl. B41j *31/14, 27/00, 29/16*

U.S. Cl. 197—171 **9 Claims**



A tape having a smooth surface upon which a low melting point ink has been flowed, has ink reflowed over those por-

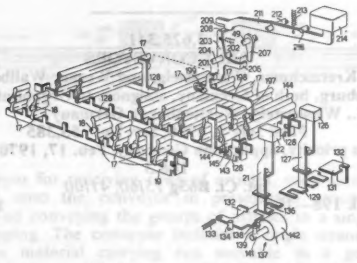
tions which have been struck by typewriter keys. To effect a redistribution of the ink on the tape, heat is imparted locally thereto, such heat being applied to the typewriter tape either by conduction or radiation. Alternatively, the ink may be caused to flow freely at ambient temperatures and then be permitted to dry to a film thickness.

3,625,335

DEVICE FOR TABULATING PRINTED CHARACTERS TO THE RIGHT FOR TELEPRINTERS AND SIMILAR DATA TERMINAL PRINTOUT APPARATUS

Giuseppe Ricciardi, and Luciano Rattin, both of Ivrea, Torino, Italy, assignors to C. Olivetti Ing. & C., S.p.A., Ivrea (Torino), Italy

Filed Apr. 22, 1969, Ser. No. 818,300
Claims priority, application Italy, Apr. 26, 1968, 51435-A/68
Int. Cl. B41j *25/18*
U.S. Cl. 197—176 **7 Claims**



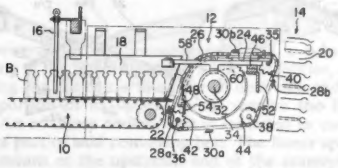
In printers, such as used in teleprinters and data terminal equipment, having a carriage for providing relative motion between a printing paper support and a type carrier, a mechanism for backspacing the carriage responsive to a backspace code and an accumulator for storing code combinations corresponding to characters set on a keyboard; a mechanism for right justifying a group of characters to be printed comprising locking means responsive to setting of a first character in the group to prevent readout from said accumulator of the code combinations of entered characters, means to generate said backspace code independently of the accumulator upon setting of each character of the group and control means for disengaging the locking means and effecting readout of said accumulator; whereby said carriage may be spaced to a tabulated position, the characters of said group may be entered without printing while the carriage backspaces for each entry, and then the characters may be automatically read out of said accumulator printing right justified to the tabulated position.

3,625,336

BOTTLE-LOADING APPARATUS

Yoshikazu Fuwa; Yoshio Sata, both of Nagoya; Tadaaki Ono, Inazawa, and Shiro Kato, Nagoya, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Aug. 11, 1969, Ser. No. 849,055
Claims priority, application Japan, Aug. 8, 1968, 43/62115
Int. Cl. B65g *47/57*
U.S. Cl. 198—22 **7 Claims**



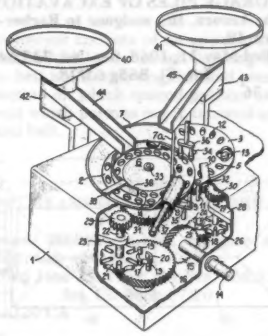
A bottle-loading apparatus, for loading bottles, supplied from a bottle conveyor, into an apertured carrier of a bottle-processing apparatus, comprises guide means receiving and guiding a row of bottles, supplied from the bottle conveyor, into the carrier. Transfer means that are cooperable with the guided bottles, and include at least a pair of endless belts, such as chain belts, extending along the guide means. Push rods extend transversely of the guide means and are coupled to the belts for driving along the guide means to push bottles, supported on the guide means, toward the carrier. When the apertures of the carrier are arranged in laterally staggered rows, the guide means are cyclically reciprocated laterally to align with the apertures in the successive rows. Preferably a bridge member is provided between the carrier and the discharge ends of the guide means to support the lower surfaces of the bottle during transfer to the carrier. The carrier may be stopped periodically and cyclically when the transfer means engages the bottles on the guide means.

3,625,337

DEVICE FOR COORDINATING AND SEPARATELY SUPPLYING OBJECTS WRAPPING MACHINE

Ariosto Seragnoli, Via Bollinzona, 31 Bologna, Italy

Filed Mar. 28, 1969, Ser. No. 811,423
Claims priority, application Italy, Apr. 3, 1968, 1588A/68
Int. Cl. B65g *47/26*
U.S. Cl. 198—32 **6 Claims**



A device for coordinating and separately supplying objects, such as sugar-drops and the like, to a paper-wrapping machine, is described as having intermittently moving dispensing means acting as a bottom for a container provided with holes each for receiving an object, with intermittently moving conveyor means, provided with holes and by partial overlapping said dispensing means for receiving the objects therefrom and supply the same to the paper-wrapping machine, the holes in said dispenser means being arranged in sets and the intermittent movement of the dispensing means being coordinated with the holes and intermittent movement of the conveyor means, so that at each transfer step a plurality of objects in the individual holes of said plurality of hole sets in the dispensing means pass to as many individual subsequent holes in the conveyor means, the sets of holes in the dispensing means being separated from one another by a stationary wall concentrically disposed there between which is interrupted in the area comprising the transfer station.

3,625,338

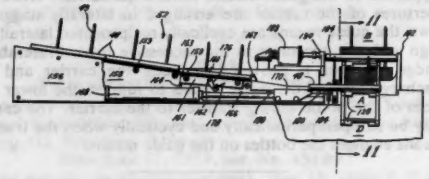
METHOD AND APPARATUS FOR STACKING SHEET MATERIAL

Wesley D. Cawley, 721 Avenue A., Port Neches, Tex.

Original application Sept. 18, 1967, Ser. No. 668,412, now Patent No. 3,523,686. Divided and this application July 10, 1969, Ser. No. 842,826
Int. Cl. B65g *47/04, 57/02*
U.S. Cl. 198—35 **18 Claims**

The present invention is directed to apparatus used to automatically stack sheet material on supports for ease of handling. Endless conveyors are utilized to carry spring loaded, cam operated gripper jaws at a constant speed. At pickup and release stations, the conveyors move about

sprockets, whereby their speed is slowed to allow the proper pickup or release of the sheet material. A novel indexing means is used to position the supports at the receiving station and to remove loaded supports, whereby the movement of the conveyors need not be stopped or slowed. Vacuum



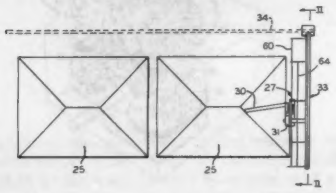
means are positioned adjacent the release station for stretching the sheet material to a horizontal position for stacking, and fingers are employed to urge the material onto the stacking supports. The indexing means includes the indexing turret, rotation means and tracks for loading and unloading the supports.

3,625,339

REMOVAL AND CONVEYING OF MATERIAL FROM STORAGE PILES OF EXCAVATIONS

Fred T. Smith, Aurora, Ill., assignor to Barber-Greene Company, Aurora, Ill.

Filed May 31, 1968, Ser. No. 733,648
Int. Cl. B65g *65/28*
U.S. Cl. 198—36 **32 Claims**



A material moving machine is operated to loosen and remove material in successive cuts or swaths of predetermined width and substantial length from the face of a material source such as a storage pile or an excavation. A conveyor on the opposite side of the moving machine and receiving the removed material therefrom extends substantially parallel and in spaced relation to the material source face. As the position of the face shifts relative to the conveyor due to removal of successive swaths of material requiring consequential shifting movement of the machine, the conveyor correspondingly moves up to maintain substantially the same spaced relation between the successive positions of the face, the machine and the conveyor to facilitate reception of the material from the machine. The conveyor comprises a plurality of articulated sections connected in end-to-end relation and having a continuous single endless conveyor belt carried by sections, with running wheels supporting the sections and means for driving certain of the wheels to move the conveyor as a unit.

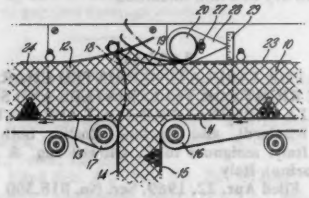
3,625,340

ARTICLE-HANDLING APPARATUS

Alan Keith McCombie, London, England, assignor to Molins Machine Company Limited, Deptford, London, England

Filed May 7, 1969, Ser. No. 822,386
Claims priority, application Great Britain, May 10, 1968, Feb. 28, 1969; 22,413/68, 10,942/69
Int. Cl. B65g *43/00, 43/08*
U.S. Cl. 198—37 **12 Claims**

This invention is basically an improvement on the sliding piston-type sensor used for example at 21 or at right-angle downward bends to deliver cigarettes from a horizontal overhead conveyor to a chute extending downwards to a packing machine. The sensor according to this invention is preferably pivoted and has a convex underneath surface so as to



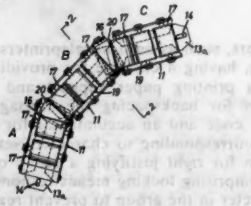
respond rapidly to a drop in the level of the cigarettes beneath it by sinking into the hollow formed in the surface of the cigarette stack.

3,625,341

BELT CONVEYORS

Heinz Kretzschmar, Wiesensteig, and Werner Wallberg, Ludwigsburg, both of Germany, assignors to Organisation Rolfs K.G., Wiesensteig (Wurttenburg), Germany

Filed July 9, 1970, Ser. No. 53,385
Claims priority, application Germany, Feb. 17, 1970, P 20 07 166.3
Int. Cl. B65g *15/60, 41/00*
U.S. Cl. 198—109 **10 Claims**



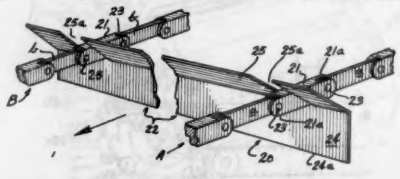
In a belt conveyor an assembly comprising at least two sections similarly constructed. Each of the sections comprises a frame, having a plurality of rollers journaled thereon for supporting a belt. The sections are adjustably secured in tandem along a defined radius of curvature and are provided with connecting rollers between adjacent sections. The connecting rollers being journaled beneath the supporting rollers, and being themselves pivotably mounted mounted to the connecting means to permit the training of the belt in a continuous path from one section to another.

3,625,342

FLIGHT CONSTRUCTION

Robert W. Clyne, 5701 Sheridan Road, Chicago, Ill.

Filed Aug. 21, 1969, Ser. No. 851,982
Int. Cl. B65g *19/22*
U.S. Cl. 198—174 **3 Claims**



A flight is provided for use in an apparatus which is adapted to handle waste products or the like that have accumulated on a surface. The flight is connected to and forms a

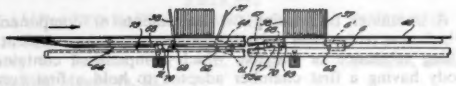
part of a conveyor means and is adapted to move across the surface and remove the accumulated waste therefrom. The configuration of the flight is such that it has a short moment arm whereby the overturning moment of force encountered by the flight when in moving contact with the accumulated waste is small.

3,625,343

CONVEYOR RECEIVING AND CONVEYING ROWS OF ARTICLES IN PRESELECTED GROUPS FOR WRAPPING

Richard C. Talbot, Skokie, Ill., assignor to Peters Machinery Company, Chicago, Ill.

Original application Apr. 1, 1968, Ser. No. 717,688, now Patent No. 3,500,984. Divided and this application Oct. 17, 1969, Ser. No. 871,345
Int. Cl. B65g *17/16*
U.S. Cl. 198—179 5 Claims



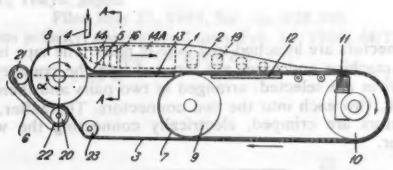
Conveyor for receiving rows of articles, such as cookies, dropped onto the conveyor in preselected groups from above, and conveying the groups of articles in a single row for wrapping. The conveyor includes a single strand chain having a material carrying run movable in a generally horizontal plane and having sets of leading and trailing flights spaced along the chain and extending upwardly of the material carrying run of the conveyor. The flights are carried by attachments, pivotally connected to the chain to pivot about the axes of certain pintle pins of the chain. A series of cams engaged by followers on the attachments opens two flights at a receiving position to form in effect a hopper and receive a group of articles deposited from above, and closes the two flights to close the space between the articles and hold the articles in vertical positions for wrapping.

3,625,344

ENDLESS BELT CONVEYOR

Maurice Debeaux, Lyon, France, assignor to Rhone-Poulenc S.A., Paris, France

Filed Oct. 17, 1969, Ser. No. 867,156
Claims priority, application France, Oct. 18, 1968, 170537
Int. Cl. B65g *15/08*
U.S. Cl. 198—192 9 Claims



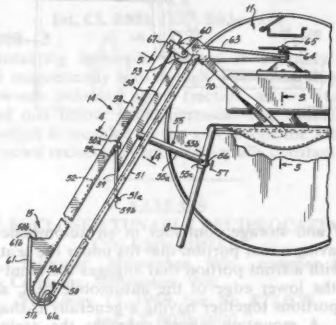
A conveyor for continuously receiving a substance and conveying in the liquid state and while it solidifies, in which a conveying endless belt is driven at its upstream end to form a dished portion in its upper run to receive the liquid substance. An auxiliary endless belt is mounted in contact with at least a part of said conveying belt. The linear speed of the driving means at the upstream end of the conveying belt is greater, e.g., 0.1 to 6 percent, than the speed of the auxiliary endless belt.

3,625,345

FEED CONVEYER FOR MEAT AND BONES SEPARATOR

Lucas J. Conrad, and Gerard Eugene Leonard, both of Winston-Salem, N.C., assignors to R. J. Reynolds Company, Winston-Salem, N.C.

Filed Mar. 18, 1970, Ser. No. 20,564
Int. Cl. B65g *15/60*
U.S. Cl. 198—204 9 Claims



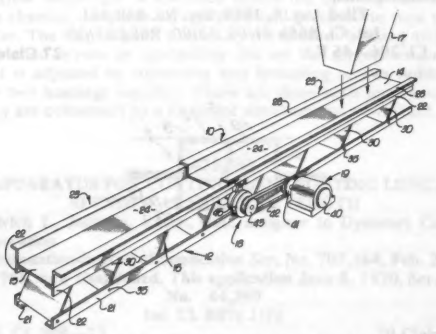
The feed conveyor consists of an upper trough defining a conveying reach and a lower trough defining a return reach. The conveyor belt is a simple single strand plastic belt of circular cross section on which spaced pushers are mounted by an arrangement which permits ready removal and cleaning of the pushers and belt.

3,625,346

STABILIZING MEANS FOR A VIBRATORY CONVEYOR APPARATUS

Lee B. Holman, Whittier, Calif., assignor to State Steel Products, Inc., City of Industry, Calif.

Filed June 25, 1969, Ser. No. 836,526
Int. Cl. B65g *27/20*
U.S. Cl. 198—220 CA 3 Claims

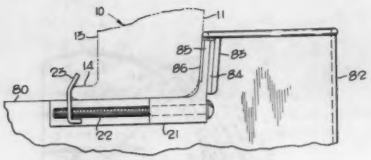


A stabilizing and support means for an actuating means arranged to impart vibratory forces to at least two longitudinally aligned conveyor sections resiliently supported by inclined members from a base frame. The stabilizing means includes stabilizing members yieldably interconnecting a shaft of the actuating means with one of adjacent conveyor section end portions whereby the actuating means is fully floatingly supported by the conveyor sections and whereby transmission of vibratory forces to the base frame means and its supporting floor structure are virtually eliminated.

3,625,347
LITTER AND STORAGE CONTAINER IN AN AUTOMOBILE SEAT ASSEMBLY

Earl M. Trammell, Jr., 39 Salem Estates Drive, Ladue, Mo.

Filed Dec. 2, 1969, Ser. No. 881,415
Int. Cl. B60n 3/08
U.S. Cl. 206—19.5 R 7 Claims

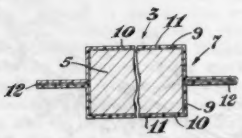


A litter and storage container in an automobile seat assembly, having a rear portion that fits under the seat communicating with a front portion that engages the front seat side adjacent the lower edge of the automobile seat, said front and rear portions together having a generally L-shaped configuration. A mounting means connects the casing to the seat, the mounting means including an adjustable clamp means connected to the container and engaging a rearwardly facing seat shoulder to hold the container tightly against the front seat side. In one embodiment, the clamp means includes a threaded fastener that extends through socket, connected to the container by magnets, and a hook threadedly attached to the fastener that engages the seat shoulder to clamp the seat between the hook and casing flange. In another embodiment, the clamp means includes a flat coil spring having one end attached to the container and the opposite end attached to the seat shoulder, the spring loading clamping the seat between a spring end and the container front portion. The container includes telescopically related upper and lower sections, the container sections being adjusted for different underseat heights.

3,625,348
PACKAGING ARTICLES IN CONTAINERS HAVING SELF-ADHERING INNER LAYERS

Oliver R. Titchenal, Berea, Ohio, and Almar T. Widiger, Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Aug. 8, 1969, Ser. No. 848,441
Int. Cl. B65b 31/00, 53/00; B65d 85/00
U.S. Cl. 206—46 F 27 Claims

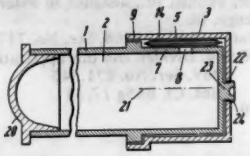


An article is packaged in a multilayer flexible plastic sheet having a layer of a self-adhering plastic material and a layer of normally solid, thermoplastic organic polymer by (1) inserting the article between two opposing portions of the multilayer plastic sheet such that the layer of self-adhering plastic material faces the article; (2) collapsing the opposing portions into conforming contact with the article such that essentially all gases are permitted to pass out of the resulting package; and (3) sealing together the opposing contacting surfaces of said opposing portions to form a hermetically sealed package such that the self-adhering plastic material remains in clinging, conforming contact with the article and itself upon puncture of the multilayer plastic sheet.

3,625,349
DUPLEX CAPSULE FOR DENTAL FILLING INGREDIENTS

Ernst A. Muhlbauer, Hamburg, Germany, assignor to Zahn-Porzellan KG E. Muhlbauer & Co., Hamburg, Germany

Filed Nov. 6, 1969, Ser. No. 874,540
Claims priority, application Germany, Mar. 4, 1969, P 19 10 885.1
Int. Cl. B65d 81/32
U.S. Cl. 206—47 A 9 Claims

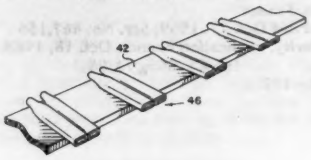


A container for storing two ingredients or components which are to be later mixed together to produce a dental filling substance or the like which comprises a container body having a first chamber adapted to hold a first component, said chamber having a sidewall with at least one perforation; a rotatable closure member partially encompassing and eccentric to said container body, said closure member cooperating with said perforated wall to define a second chamber for holding a bag of frangible material containing a liquid second component, said second chamber having a wall section of diminishing radius whereby upon rotation of said closure member and the volume of the second chamber is reduced and the bag is pressed against the perforated wall so as to burst and deliver the liquid into the first chamber.

3,625,350
WEB AND CONNECTORS

Jimmy C. Ray, Denison, Tex.

Continuation-in-part of application Ser. No. 836,291, June 25, 1969, which is a division of application Ser. No. 525,506, Feb. 7, 1966. This application Aug. 12, 1970, Ser. No. 63,255
Int. Cl. B65d 85/54; H02g 15/08
U.S. Cl. 206—56 A 8 Claims



Connectors are attached to a tape in pairs. The tape is fed into a machine and wires are inserted into the connectors. Four wires are selected, arranged in two pairs and then are inserted, two each into the two connectors. Thereafter, the connectors are crimped, electrically connecting the wires together.

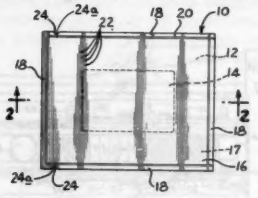
3,625,351
A STERILIZED TEARABLE BAG

Melvin I. Eisenberg, 2908 West Lunt, Chicago, Ill.

Filed Apr. 22, 1969, Ser. No. 818,272
Int. Cl. B65d 27/32, 83/00; A61b 19/02
U.S. Cl. 206—56 AA 9 Claims

A sterilized tearable bag is preferably made by forming sheets of polyvinyl chloride material most advantageously striated throughout. Before or after cutting the sheets to size, they are placed into confronting relation with the striations extending in the same direction and sealed around the

product to be sterilized. The bag walls can be brought into face-to-face contact beyond the product so the bag can be



subsequently torn along a pair of aligned striation-forming indentations.

3,625,352

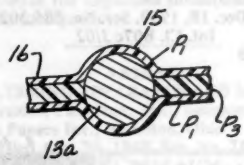
LAMINATED FASTENER STRIP HAVING INNER AND OUTER LAMINAE OF DISPARATE MELTING POINTS

Garry R. Perkins, Cary, Ill., assignor to Spotnails, Inc., Rolling Meadows, Ill.

Filed Oct. 22, 1969, Ser. No. 868,375

Int. Cl. B65d *83/00*

U.S. Cl. 206—56 DF **3 Claims**



The elongated tape comprises a flexible continuous outer laminae of a first plastic material heat-fused at first segments directly to opposed exterior portions of the fastener shanks spaced along said tape and laminated second segments alternately arranged with and interconnecting the first segments. Each second segment has an outer laminae formed of corresponding portions of the continuous outer laminae with a flexible inner lamina of a second plastic material. The melting point of the inner laminae of the second segment is lower than that of the outer laminae.

3,625,353

PACKAGE FOR STERILIZED ARTICLES

Ichiro Ishii, Tokyo, Japan, assignor to Jintan Terumo Co., Ltd., Tokyo, Japan

Filed May 27, 1969, Ser. No. 828,305

Claims priority, application Japan, Feb. 19, 1969, 44/11778

Int. Cl. B65d *81/18*

U.S. Cl. 206—63.2 R **4 Claims**

A package particularly adapted for use in sterilizing and storing medical implements, which comprises a plastics vessel having an opening for receiving or taking out the article, and a sealing sheet made of plastics-impregnated, gas-permeable moistureproof and germproof paper, and having a hot-melt-type adhesive agent coated on the back for sealing the opening.

3,625,354

PROCESS FOR MAGNETICALLY SEPARATING REDUCED IRON-CONTAINING MATERIALS DISCHARGED FROM A ROTARY KILN

Gunter Heitmann, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany and The Steel Company of Canada Limited, Ontario, Canada

Filed Jan. 21, 1969, Ser. No. 792,831

Claims priority, application Germany, Jan. 23, 1968, P 15 83 774.8

Int. Cl. B03b *1/00*; **B03c** *1/30*

U.S. Cl. 209—3 **4 Claims**

Iron-containing materials reduced in a rotary kiln are separated magnetically into a high iron-containing fraction and a low-ash reducing agent fraction in two stages, one above and one below 1,000 oersteds. The reducing agent fraction which is recycled to the kiln, keeps the ash content of the recycled reducing agent substantially constant.

3,625,355

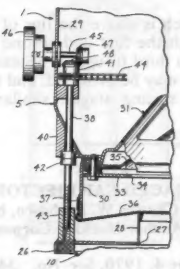
FULLY ENCLOSED TUNABLE RECIPROCATING AIR COLUMN SIFTER

Robert L. Schurrer, Milwaukee, Wis., assignor to Allen-Bradley Company, Milwaukee, Wis.

Filed Nov. 17, 1969, Ser. No. 877,079

Int. Cl. B07b *9/00*

U.S. Cl. 209—21 **4 Claims**



A reciprocating air column sifter includes rigid, fully enclosed speaker and screen housings which define air chambers of sufficient volume to allow reciprocal air movement. A flexible diaphragm is stretched across the opening between the chambers and can be tightened and loosened to tune the sifter. The diaphragm is carried by the speaker housing and is stretched across an upstanding rim on the screen housing, and is adjusted by tightening and loosening screws holding the two housings together. There are three such screws, and they are connected by a chain for simultaneous movement.

3,625,356

APPARATUS FOR CONTINUOUSLY SORTING LONG, SLENDER ARTICLES BY LENGTH

Aldrich L. Jackson, Eustis, Fla., assignor to Dynasort Corporation

Continuation-in-part of application Ser. No. 707,164, Feb. 21, 1968, now abandoned. This application June 8, 1970, Ser. No. 44,399

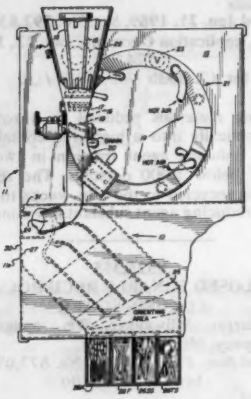
Int. Cl. B07c *1/14*

U.S. Cl. 209—73 **20 Claims**

Apparatus for rapidly and continuously sorting relatively long, slender articles, such as silverware, into a plurality of categories which are differentiated by the length of the articles in each category.

All the articles, which may be pieces of silverware, drop endwise from an inclined delivery chute into a restricted indexing area of an indexing surface, and the indexing area is so tilted that the upper ends of the articles swing outwardly by gravity toward a series of vertically spaced, transversely extending gauge bars. Inclined sorting troughs for short pieces (spoons), intermediate pieces (forks), and long pieces (knives) extend downwardly from the outer margin of the indexing surface, and the gauge bars are so arranged that short

pieces swing beneath all the bars directly into a first trough, the upper end portions of the intermediate pieces slide along a lower gauge bar which spans the first trough and terminates alongside a second trough into which those pieces fall; while the upper end portions of the long pieces slide along an

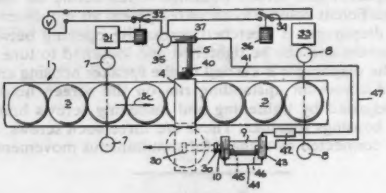


upper gauge bar which is above the tips of the intermediate pieces and spans both the first and second troughs, so such long pieces fall into a third trough. If necessary, four troughs and three gauge bars may be provided; and there may be one or more secondary sorting stages, similar to the first, if needed.

3,625,357
DAMAGED CAP EJECTOR

Charles S. Ochs, and Charles W. Probasco, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio

Filed May 4, 1970, Ser. No. 34,450
Int. Cl. B07c 3/02
U.S. Cl. 209—74 **12 Claims**



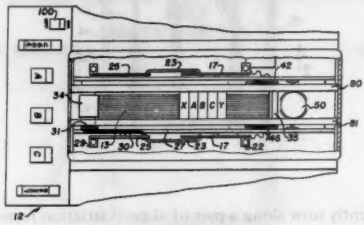
A bent cap ejector for a closure cap feed chute. A cap gauge captures and holds improperly shaped or bent caps as they pass along the chute. Sensing devices detect the resulting stoppage of cap flow and the gauge with the bent cap therein is moved clear of the chute. An ejector located outside of the chute then punches the improperly shaped cap from the gauge and the gauge is then moved back into the chute. A stop is automatically operated by the gauge movement to stop the flow of caps along the chute when the gauge is moved clear of the chute. The reinsertion of the gauge into the chute disengages the stop member from the chute thereby reinstating flow of the caps.

3,625,358
RANDOM FILING SYSTEM

Keith D. Duperron, Box 178, Creston, British Columbia, Canada

Filed Aug. 20, 1969, Ser. No. 851,673
Int. Cl. B07c 3/16
U.S. Cl. 209—80.5 **23 Claims**

Apparatus for selecting one or all similar cards from a plurality of randomly distributed and different cards, the cards having magnetizable tags along an edge, in which there is a plurality of magnets which can be selectively and independently energized and deenergized. There are means for moving the cards into contact with the magnets so that ones with

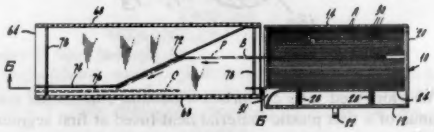


tags corresponding to the energized magnets are held by those magnets and those which do not have corresponding tags can be moved from the magnets. In this way selected cards, regardless of their positions in a stack of cards can be separated from nonselected cards.

3,625,359
CARD TRANSFER DEVICE FOR INFORMATION RETRIEVAL SYSTEMS

Laurence Allan Cross, Jr., Lambertville, N.J., assignor to Randomatic Data Systems Inc.

Filed Dec. 18, 1969, Ser. No. 886,302
Int. Cl. B07c 3/02
U.S. Cl. 209—80.5 **4 Claims**



A cartridge holding a deck of randomly filed coded cards opens upon an information retrieval station to which a selected card is to be transported. A card selection apparatus selects the wanted card and offsets it from the deck proper. A carrier bar engages the offset card and moves it to the retrieval station where the information on the card is read, photographed, copied or otherwise retrieved. By a return movement of the bar, the card is reinserted in the deck through an entranceway provided in the cartridge for this purpose.

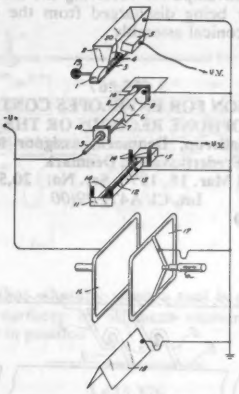
3,625,360
ELECTROSTATIC SEPARATION METHOD AND APPARATUS

Alfred Schickel, Freiberg/Saxon, Germany, assignor to Deutsche Akademie Der Wissenschaften Zu Berlin Institut Fur Aufbereitung, Freiberg/Saxon, Germany

Filed May 19, 1969, Ser. No. 825,759
Int. Cl. B03c 7/12
U.S. Cl. 209—127 B **13 Claims**

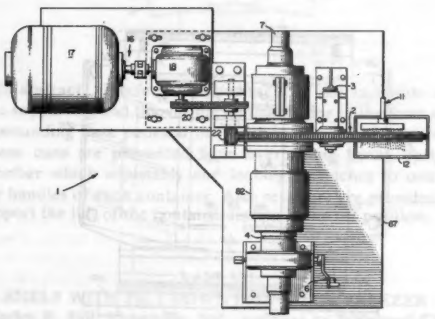
A process and accompanying apparatus through which finely intermixed particles are separated into their individual components or groups of components. A feed hopper by which the rate of flow of a production process can be controlled through the application of perforated plates, allows the mixture of particles to fall freely through a high-voltage charger which charges the particles through ionic current of a corona discharge. The particles fall freely through the charger and then impinge upon a series of baffles spaced from each other and arranged so that the particles impinge upon the baffles which are connected to ground potential, and thereupon drop through spaces between the baffles. The baffles discharge the particles as a function of their surface conductivities while contacting the particles. A plate capacitor beneath the baffles serves to separate the discharged par-

ticles and to deflect them in accordance with the components or group components to which they belong to. A V-shaped



collector beneath the capacitor plates serves to collect the grouped and sorted particles.

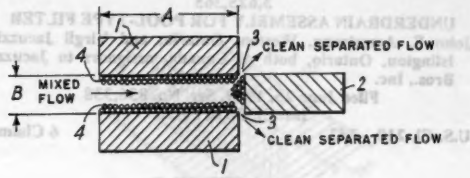
3,625,361
FILTERING APPARATUS AND METHOD
Robert B. Frazier, Pasadena, Tex., assignor to U.S. Plywood-Champion Papers Inc., Hamilton, Ohio
Filed Aug. 30, 1968, Ser. No. 756,542
Int. Cl. B01d *33/24*
U.S. Cl. 210—77 **14 Claims**



A filtering apparatus and method wherein a filter screen is moved through a liquid stream that is passing through closed conduits while liquidtight sliding seals are maintained between the conduit and screen.

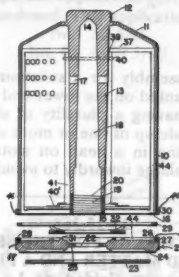
3,625,362
REMOVAL OF OIL FROM WATER
Marcel Clarence Sicard, Cheshire, Conn., assignor to AMF Incorporated
Filed June 2, 1969, Ser. No. 829,451
Int. Cl. B01d *25/18*
U.S. Cl. 210—96 **10 Claims**

A combination filter/separator device and a system for its application which will separate a mixture, or suspension or emulsion of incompletely miscible fluids of different physical characteristics and deliver one component in a filtered condi-



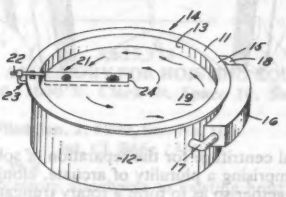
tion and the others containing all of the original particulate contamination.

3,625,363
SPIN-ON TYPE FILTERS
John Eberle, 2027 28th Ave. S.W., Calgary, Alberta, Canada
Filed Feb. 26, 1970, Ser. No. 14,486
Claims priority, application Japan, Feb. 27, 1969, 44/14967
Int. Cl. B01d *35/14, 27/10*
U.S. Cl. 210—130 **11 Claims**



A replaceable filter which includes an outer perforated canister and an inner star-shaped, perforated canister around which is woven a plurality of layers of nonwoven relatively open-pored filter material. A relief valve surrounds the inner stem in the form of a resilient washer which lets oil bypass the filter without dumping dirt or oil back into the oil stream.

3,625,364
SKIMMING DEVICE FOR SWIMMING POOLS
Charles H. La Chance, 23838 Oak Ave., Dearborn, Mich.
Filed Sept. 22, 1969, Ser. No. 859,858
Int. Cl. E04h *3/20*
U.S. Cl. 210—169 **3 Claims**



The invention relates to a skimming device which is used to remove floating debris from swimming pools provided with means for circulating the water in the pool. The skimming device comprises a pole and a screening. One end portion of the pole is supported from the edge of the pool while the other portion extends inwardly of the edge so as to be positioned above and substantially parallel with the surface of the

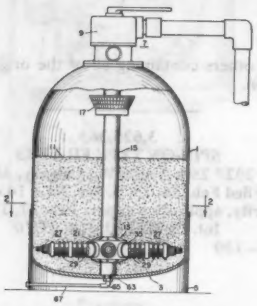
pool water. The screening is supported from the extending portion of the pole and extends downwardly into the water.

3,625,365

UNDERDRAIN ASSEMBLY FOR POOL-TYPE FILTER

John E. Armstrong, Weston, Ontario, and Virgil Jacuzzi, Islington, Ontario, both of Canada, assignors to Jacuzzi Bros., Inc.

Filed June 25, 1969, Ser. No. 836,338
Int. Cl. B01d 23/20
U.S. Cl. 210—232 6 Claims



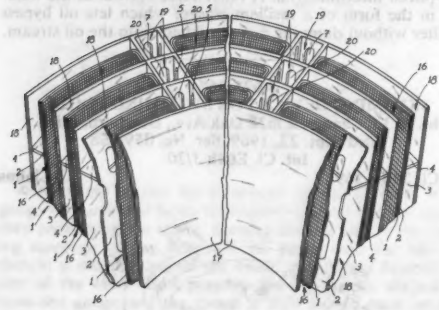
An underdrain assembly for a swimming pool-type filter, involving a hub mounted on the lower end of a central return flow column, and having a plurality of slotted radial arms, each of which is made up of one or more similar snap on sections and terminating in a snap on slotted terminal component. The slots enlarge inwardly to avoid clogging.

3,625,366

CONICAL CENTRIFUGE FOR THE SEPARATION OF SOLID MATTER AND A FLUID

Felipe Urbano Garrone, Cuidad de La Paz 432, piso 6, Buenos Aires, Argentina

Filed Sept. 9, 1970, Ser. No. 70,818
Int. Cl. B01d 33/02
U.S. Cl. 210—330 1 Claim



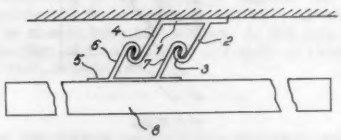
A conical centrifuge for the separation of solid matter and a fluid, comprising a plurality of arcuate, elongated sections grouped together so as to form a rotary truncated conical assembly, each section having a filter, a support for the filter, and a backplate provided with guide fins for the channelling of the fluid passing through the filter, the sections being flanked by, radially extending chambers communicating with the chambers through openings formed in the part of these chambers located opposite the space between the respective supports and backplates, an inlet for admitting fluid carrying solid matter being disposed at the truncated end of the assembly, the inlet communicating with each filter section, the radially extending chambers communicating with each other and with the openings disposed on a corresponding generating line of the truncated assembly for the discharge of treated fluid, the assembly being surrounded by an envelope for receiving the filtered fluid and the solid matter being surrounded by an envelope for receiving the filtered fluid and the solid matter being discharged from the end of larger diameter of the conical assembly.

3,625,367

SUSPENSION FOR ENVELOPES CONTAINING GRAMOPHONE RECORDS OR THE LIKE

Rene Morck, Ballerup, Denmark, assignor to A/S Platex-Plastartikler, Frederiksvaerk, Denmark

Filed Mar. 18, 1970, Ser. No. 20,533
Int. Cl. A47g 29/00
U.S. Cl. 211—40 5 Claims



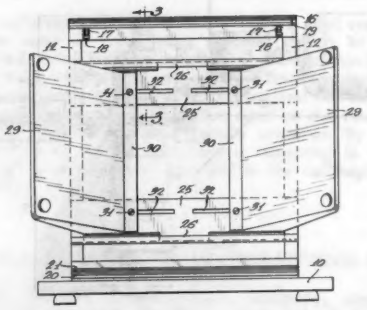
Suspension for envelopes containing gramophone records or the like and consisting of suspension rails having movable slides secured to envelope suspension elements extending at right angles to the rails. Each suspension element is formed as a tube having a slot at the bottom and is adapted to slidingly receive a web permanently attached to the upper edge of the envelope.

3,625,368

ADJUSTABLE CAPACITY RECORD HOLDER

Lloyd M. Toms, Crozet, Va., assignor to Acme Visible Records, Inc., Crozet, Va.

Filed Oct. 20, 1969, Ser. No. 867,757
Int. Cl. G09f 11/06
U.S. Cl. 211—51 2 Claims



An adjustable capacity stand for pivotally mounting a plurality of visible record frames on inclined axes and slidably and adjustably mounted inclined end stop members that will accommodate a varying complément of frames which are normally mounted between said end stop members.

3,625,369

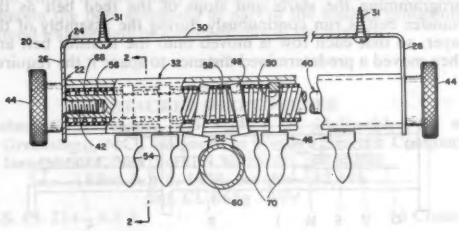
MECHANICAL HOLDING DEVICE

Earl L. Walls, 7460 La Jolla Blvd., La Jolla, Calif.

Filed Mar. 9, 1970, Ser. No. 17,670
Int. Cl. A47f 7/00
U.S. Cl. 211—60 R 12 Claims

The holding device includes an elongated support for a plurality of elements having sections providing gripping sur-

faces for a tool or instrument, the gripping surfaces of adjacent elements confronting one another. The adjacent elements are flexibly and resiliently movable toward and away



from one another whereby when a tool is pressed between the gripping surfaces of adjacent elements, the tool is yieldingly held in position.

3,625,370

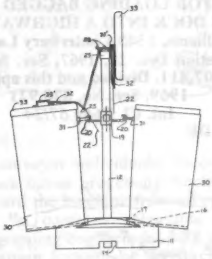
PORTABLE RECEPTACLE SUPPORT

Maxie R. Mintz, 543 Dale Drive, Fayetteville, N.C.

Filed Aug. 11, 1970, Ser. No. 36,404

Int. Cl. A47g *29/00*

U.S. Cl. 211—71 **10 Claims**



In abstract, a preferred embodiment of this invention is a can-supporting and tipover preventing device in the form of a freestanding base pedestal on which a number of cans rest. These cans are prevented from overturning by an upright member which adjustably and lockingly attaches to one of the handles of each container. Also retainers are provided to support the lids of the containers when in the off position.

3,625,371

SHELF WITH TILT DOWN FRONT FOR FREEZER

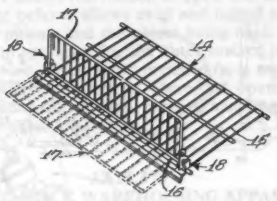
Charles R. Dill, Evansville, Ind., assignor to Whirlpool Corporation

Continuation of application Ser. No. 654,400, July 19, 1967, now abandoned. This application Sept. 5, 1969, Ser. No. 856,908

Int. Cl. A47b *96/02*; **A47f** *5/00*

U.S. Cl. 211—153 **8 Claims**

A shelf structure for use in a cabinet such as a freezer cabinet having a removable upright front panel for selectively arranging the shelf as a basket-type shelf and an open-type shelf. The means for connecting the panel to the shelf moves rearwardly of the front edge of the shelf during removal therefrom so as to guide articles on the shelf away from the front edge during such removal. The panel is pivotally mounted on the shelf to swing to a horizontal position wherein it comprises a loading, or unloading table for facilitated transfer of the articles relative to the freezer compartment. In one form, the connector is arranged to permit removal and installation of the panel in a vertical disposition. In another form, the connector is arranged to permit removal and installation of the panel in a horizontal position, thus allowing the panel to serve as a tray for carrying the articles to and from the freezer for further facilitated transfer.



3,625,372

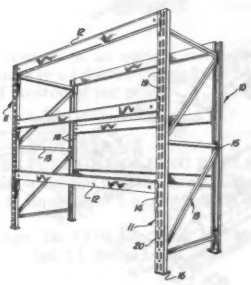
PALLET RACK

James A. MacKenzie, 100 Bronson Ave., Ottawa, Ontario, Canada

Continuation-in-part of application Ser. No. 661,247, Aug. 17, 1967, now abandoned. This application July 6, 1970, Ser. No. 52,583

Int. Cl. A47f *5/10*

U.S. Cl. 211—176 **3 Claims**



A pallet rack made from uprights, beams and end frames, easily assembled and disassembled by virtue of the uprights having two series of elongated slots to receive T-shaped projections on the beam ends and on connecting members on the end frames, the beams and uprights being reversible and the beam ends being removable.

3,625,373

FAIL-SAFE ACCESSORY FOR HOISTING EQUIPMENT

Ralph E. Hull, 1600 E. Clark St. Space 10, Santa Maria, Calif.

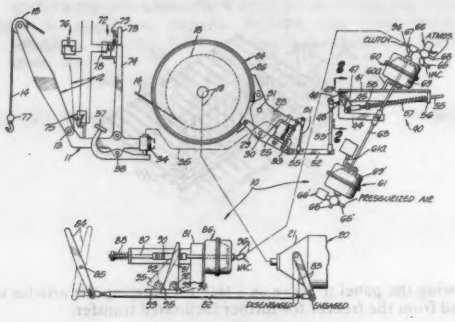
Filed Jan. 2, 1970, Ser. No. 101

Int. Cl. B66c *13/48*

U.S. Cl. 212—39 R **21 Claims**

A safety accessory attachable to existing hoist equipment to provide fail-safe operation of the winch-braking means for the hoisting cable. The accessory comprises spring-powered linkage means connectable to the winch brake and held in armed position so long as the hoist engine is operating and control means for the accessory is held cocked. The control means for the armed spring preferably includes a deadman control operable by the hoist operator, as well as remote control means operable by an observer having a good view of the operating end of the hoist cable. The accessory may and preferably does include failsafe means attachable to the

operating linkage for the clutch connecting the hoist engine to the cable winch and effective and operable to disengage



the clutch automatically and hold it disengaged under unsafe hoisting conditions.

3,625,374

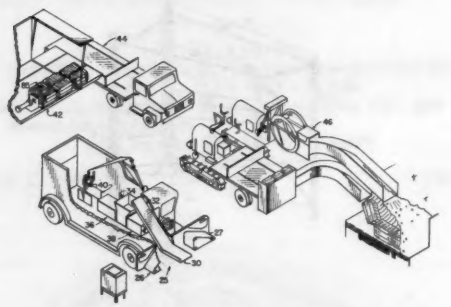
APPARATUS FOR DISPOSING OF REFUSE

Charles Wayne Hemphill, 5520 Brownfield Hwy., Lubbock, Tex.

Original application Aug. 15, 1966, Ser. No. 572,520. Divided and this application Jan. 7, 1970, Ser. No. 6,006

Int. Cl. B65g *61/00*

U.S. Cl. 214—6 B **3 Claims**



Method and apparatus for collecting and disposing of refuse by collecting refuse from a multiplicity of garbage cans which are adapted to be automatically dumped into a compacting unit where the refuse is compacted into a bale. The bales are transported to a digging apparatus which provides a ditch by digging two parallel spaced-apart vertical slots within the earth and removing the earth therefrom by passing a knife edge blade perpendicularly to and at the lower extremity of the slots to thereby continuously remove an elongated rectangular disengaged portion of the earth. The bales are placed below the surface of the ground and covered with the removed earth so as to provide the ground with improved moisture retention characteristics.

3,625,375

METHOD AND APPARATUS FOR POSITIONING MATERIAL SUCH AS BRICK BLANKS, IN STACKS

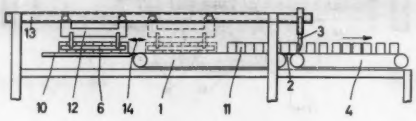
Johann Lingi, Finningerstrasse 70, Neu-Ulm/Danbue, Germany

Continuation of application Ser. No. 645,850, May 31, 1967, now abandoned. This application Apr. 22, 1970, Ser. No. 24,262

Int. Cl. B65g *57/26*

U.S. Cl. 214—6 A **9 Claims**

A method and apparatus for assembling bricks in layers or flats for stacking on a kiln car or the like wherein bricks of different sizes can be assembled in transverse rows that are spaced at various distances from one another by first moving the bricks in longitudinal rows on a feed belt against a stop which compacts them together longitudinally of the feed belt and at the same time aligns them into the transverse rows, which are then moved onto a transfer belt by automatically programming the starts and stops of the feed belt as the transfer belt is run continuously during the assembly of the layer, so that each row is moved onto the transfer belt and then moved a predetermined distance to space it the required



amount from the next row on the feed belt while the latter is momentarily stopped. The invention also includes a method and means for forming oblong stacks by feeding different numbers of longitudinal rows for alternate layers of the stack, the number of longitudinal rows for alternate layers of the stack, the number of longitudinal rows for alternate layers of the stack, the number of longitudinal rows for one layer corresponding to the length of the stack and the number of longitudinal rows for the alternate layer corresponding to the width of the stack.

3,625,376

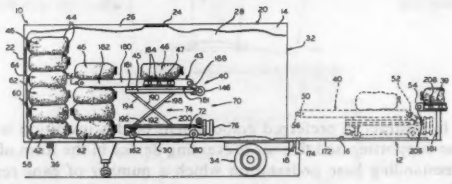
APPARATUS FOR LOADING BAGGED MAIL FROM A LOADING DOCK INTO A HIGHWAY VEHICLE

Joseph E. McWilliams, 1345 Canterbury Lane, Glenview, Ill.

Original application Dec. 28, 1967, Ser. No. 694,151, now Patent No. 3,507,411. Divided and this application June 2, 1969, Ser. No. 870,921

Int. Cl. B65g *67/24*

U.S. Cl. 214—6 DK **7 Claims**



The invention relates to the loading of mail bags from a loading dock into an end loading highway vehicle, such as a truck or a trailer, to fully load the vehicle with stacks of mail bags in which the bags are compactly loaded into place in individual stack forming tiers without those performing the bag loading operation having to enter the vehicle. In practicing the invention, the loading dock at the post office or the like is provided with a conveyor on which out-going bags are placed and oriented in closely spaced tier form. Operating between the conveyor and the highway vehicle is a carriage that receives the tier load without disturbing the orientation of the bags and brings the tier load into the vehicle loading area for discharge of the stack forming tier unit, and effects placement of the tier as part of a stack in the vehicle, again without disturbing the orientation of the bags. The carriage then returns to the conveyor for another tier load.

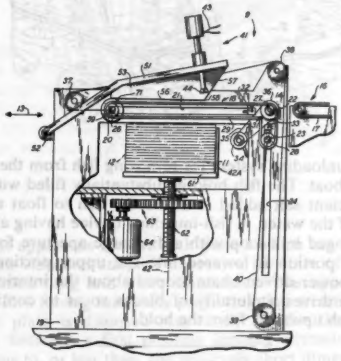
The carriage movements are controlled so that the individual tier loads are formed into vertical stacks of mail bags that are disposed to position the bags of adjacent stacks in closely spaced relation, with the vehicle being thus filled with bags throughout its load receiving area so as to make maximum use of the available loading space within the vehicle to maximize the pay load. The operation of the carriage is mechanized so that workers do not have to go into the vehicle, and palleting of the bags in groups is avoided while still achieving uniform loading in tier form.

Several specific arrangements for practicing the invention are disclosed in which the carriage either operates on the floor of the vehicle and loading dock, or is suspended for operation within the vehicle, wherein the carriage is either self-propelled or cable actuated, wherein the bags as loaded extend either longitudinally or transversely of the vehicle, and wherein the tiers employed as part of the loading procedure extend transversely or longitudinally of the vehicle.

3,625,377
STACKED SHEET FEEDER

Robert C. Bohannon, and William H. McDaniel, both of Greensboro, N.C., assignors to Western Electric Company Incorporated, New York, N.Y.

Filed July 6, 1970, Ser. No. 52,446
Int. Cl. B65g *59/04*
U.S. Cl. 214—8.5 A **13 Claims**

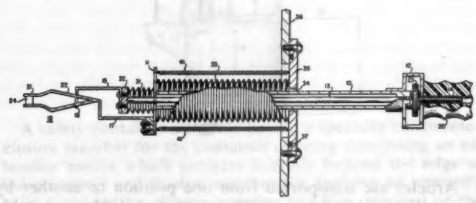


A retractable conveyor individually feeds printed circuit boards from a stack into a processing machine. As the conveyor retracts toward the machine from an extended position over the stack, it cams a releasable pickup device downwardly into gripping engagement with the top board on the stack at a position forward of the stack center. As the conveyor starts to extend again, it cams the pickup device upwardly to lift the engaged board into an inclined position over the stack and in the path of extension of the conveyor, whereupon further extension causes the conveyor to engage the inclined board and separate it from the stack. The pickup device is thereupon released so that the board drops on the conveyor to be carried into the processing machine during the next retraction.

3,625,378
HIGH-VACUUM MANIPULATING TOOL

Frank H. Attiz, 209 Emerald Hill Drive, Oxon Hill, Md.

Filed June 25, 1970, Ser. No. 49,701
Int. Cl. B25j *1/10*
U.S. Cl. 214—1 CM **2 Claims**

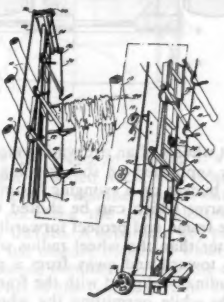


This disclosure is directed to a simple manipulator which permits handling of, and performance of work on, small objects within a vacuum chamber. In one embodiment, it is provided with pincers or tweezers having normally open tines which are closed on an object by a movable rod that extends into the vacuum chamber through a vacuumtight opening. Two flexible metal bellows are employed in the vacuum seal: the smaller one allows rod motion to open and close the pincers; the larger bellows allows axial and lateral translational motion of the pincers and the object being held. The device is provided with springs along the outer surface of the larger bellows to prevent atmospheric pressure from expanding the bellows to its maximum length. Therefore, operation of the manipulator from the outside permits handling of objects within the evacuated chamber.

3,625,379
TOBACCO STICK WAREHOUSING APPARATUS

Buford S. Gregory, and Neal J. Gregory, both of RFD #2, Box 156, Danville, Va.

Filed Apr. 3, 1970, Ser. No. 25,391
Int. Cl. B65g *65/00*
U.S. Cl. 214—16.6 **7 Claims**

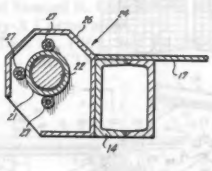


The invention consists in an upright conveyor for lifting loaded tobacco sticks in a tobacco-curing barn for placement on spaced pairs of horizontal tier poles.

3,625,380
APPARATUS FOR LOADING REELS

Albert L. Anderson, West Des Moines, Iowa, assignor to Mid-America Body & Equipment Co., Inc., West Des Moines, Iowa

Filed Apr. 20, 1970, Ser. No. 30,148
Int. Cl. B60p *1/48*
U.S. Cl. 214—77 **1 Claim**



A series of three transversely spaced lift arms are mounted on a common transverse rock shaft carried at the rear end of a portable frame for movement between a first position projected rearwardly and downwardly from the frame to a second position projected upwardly and forwardly above the frame. The center one of the lift arms is releasably secured to the rock shaft at a position spaced equidistantly from each of the outer lift arms to provide for a small reel being loaded by the center lift arm and one of the outer lift arms. On removal of the center lift arm a large reel is loaded by the outer two arms.

3,625,381

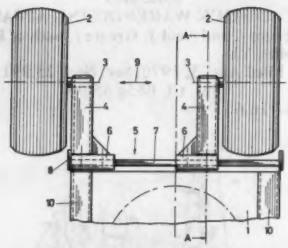
WHEEL MOUNTING FOR A VEHICULAR EXCAVATING MACHINE

Ernst Menzi, Widnau, Switzerland, assignor to Ernst Menzi A.G., Eidnau, Switzerland

Continuation-in-part of application Ser. No. 794,310, Jan. 27, 1969, now Patent No. 3,534,877. This application May 26, 1969, Ser. No. 828,453

Int. Cl. E02f *3/75*

U.S. Cl. 214—138 5 Claims



The two front wheels of an excavating machine whose rear end is normally supported on soil gripping feet, and whose frame carries a bucket on a swinging boom are rotatably attached to two arms which can be shifted transversely on a guide rail of the frame and project forwardly from the frame a distance greater than the wheel radius so that the wheels may be shifted toward and away from a position in which they are longitudinally aligned with the frame for movement on narrow paths while permitting the wheels to be moved apart for stability of the frame during excavating.

3,625,382

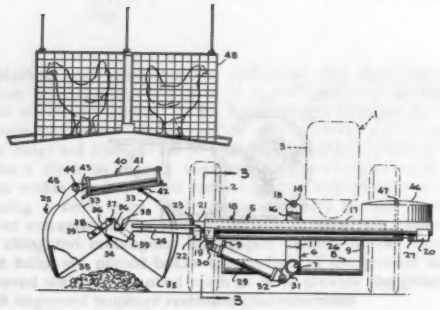
ATTACHMENT FOR TRACTORS

Walter R. Stanley, Rte. 1, Box 150, Kountze, Tex.

Filed June 19, 1969, Ser. No. 834,820

Int. Cl. B66c *3/16*

U.S. Cl. 214—147 G 4 Claims



An attachment for tractors which includes a frame fastened to the tractor and carrying a tiltable, telescoping boom to which a bottom-opening scoop is attached. The tractor can be run adjacent overhanging structure, and by manipulation of the boom and scoop debris can be gathered from beneath the overhanging structure and then carried away for disposal. The boom may be counterweighted to facilitate operation. Fluid cylinders are used to telescope and tilt the boom and to open and close the scoop.

3,625,383

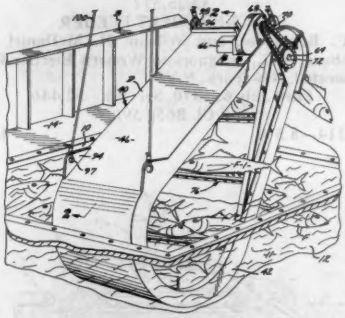
FISH UNLOADING SYSTEM

Mario J. Puretic, 259 6th Ave. North, Monte Cristo Isle, Tierra Verde, Fla.

Filed July 1, 1970, Ser. No. 51,573

Int. Cl. B63b *35/14*

U.S. Cl. 214—152 2 Claims



A fish-unloading system for removing fish from the hold of a fishing boat. The fish hold is substantially filled with water and sufficient salt added to cause the fish to float near the surface of the water. A fish-impelling device having an enclosure arranged in a loop with a discharge aperture formed in its upper portion is lowered into the upper portion of the hold. A power-driven chain looped about the interior of the enclosure drives a plurality of blades so as to continuously propell fish upwardly from the hold.

3,625,384

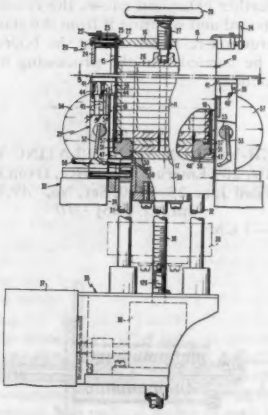
ARTICLE-HANDLING APPARATUS

Frank E. Boerger, Poughkeepsie; Carlo Nuccio, Poughkeepsie, and Charles A. Rosboschil, Wappingers Falls, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 26, 1968, Ser. No. 762,896

Int. Cl. B65g *59/00*

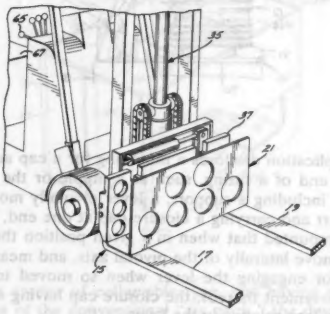
U.S. Cl. 214—306 12 Claims



Articles are transported from one position to another by being disposed in trays, which are carried within a portable magazine. The trays are automatically unloaded in sequence from the magazine and transported to a position in which the articles in the tray may be removed therefrom. The unloaded tray is then returned to the magazine and the next of the

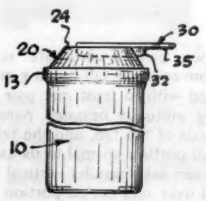
trays is removed from the magazine. The apparatus includes coding means on the magazine to indicate the status of the articles within each of the trays in the magazine.

3,625,385
FORKLIFT APPARATUS
Allan R. Ide, Cyprus, Calif., assignor to Metropolitan Stevedore Company, Wilmington, Calif.
Filed Feb. 2, 1970, Ser. No. 7,924
Int. Cl. B65g *47/00*
U.S. Cl. 214—750 **4 Claims**



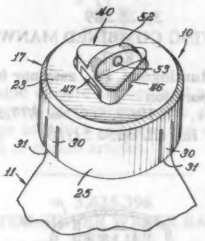
Forklift apparatus for use with pallets which are rectangular in plan view and adapted to receive the tines of a forklift in both their long and short dimensions. The apparatus includes a fork having forwardly projecting tine means. A vertical limit plate is disposed rearwardly on the tines and is shiftable between a first position limiting extension of the tine means to, or less than, the relatively short dimension and shiftable to a second position to limit insertion of the tine means under said pallets to, or less than, the long dimension. Actuation means is provided for shifting the limit plate between the first and second positions whereby such limit plate can be adjusted to permit full extension of the tines in either direction under the pallet but to limit projection of the tines from the far side of the pallet to thereby avoid damage to adjacent cargo.

3,625,386
SAFETY CONTAINER ASSEMBLY
Edward E. Schaefer, Lake Forest, Ill., assignor to Research and Safety Devices Corporation
Filed Nov. 25, 1969, Ser. No. 879,718
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **14 Claims**



A safety container assembly having a specially constructed closure member for the container opening comprising an extension means which projects laterally beyond the edge of the container and closure member for applying an upwardly axial force to the closure member to effect removal of the closure member, with the extension means being displaceable and adapted to be removed from the closure member or enclosed within the periphery of the container to increase the difficulty of removing the closure member from the container opening. A groove or recess is also provided in the upper end wall of the container which is adapted to enclose the lower end of the closure member where it is desired to further increase the difficulty of removing the closure member from the container opening.

3,625,387
SAFETY CLOSURE
Edward E. Schaefer, Lake Forest, Ill., assignor to Research and Safety Devices Corporation
Filed Oct. 17, 1969, Ser. No. 867,162
Int. Cl. A61j *1/00*; **B65d** *55/02*
U.S. Cl. 215—9 **18 Claims**

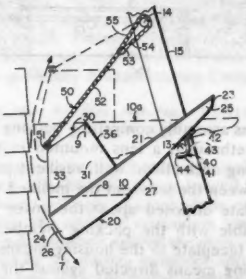


A safety closure for closing an opening in a container such as a bottle having a threaded neck. The closure includes an inner, cup-shaped closure member and an outer, cup-shaped closure member enclosing the inner closure member and freely the relative thereto. A separable key prevents relative rotation between the closure members when the key is engaged with the closure members so that the closure may be threaded onto or off of the container. The key is releasably retained in engaged relation with the closure members, but is separable therefrom to render the closure operable as a safety closure. However, if it is desired to use the closure in an ordinary manner, the key is not separated from its engaged position with the closure members. Resilient means in the form of at least one resilient arm, or a snapring, permits rapid and permanent interconnection of the closure members during assembly of the closure.

ERRATUM

For Class 220—26 see:
Patent No. 3,625,415

3,625,388
PAINT TRAY
Henry Golden, and Samuel R. Genca, both of Rochester, N.Y., assignors to Tray-X Corporation
Filed Dec. 11, 1969, Ser. No. 884,127
Int. Cl. E06c *7/14*
U.S. Cl. 220—1 **7 Claims**



A paint tray particularly useful with an upright ladder having rungs wherein the paint tray includes pivot means at a

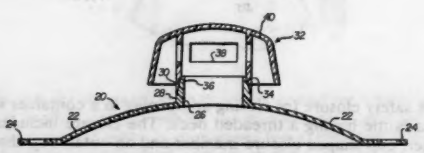
proximal end for hinge mounting the paint tray on one rung of the ladder and tension means including a tension member such as a chain, rope or the like at a distal end of the paint tray for coupling the paint tray to another rung of the ladder higher than the one rung so as to support the distal end in a number of selected positions. The tension means includes means for varying the length of the tension member between the distal end of the paint tray and the other higher rung so that the declination of the paint tray may be selected not only to compensate for the tilt of the upright ladder but also for selecting the angle at which the paint tray may be most useful. The paint tray includes a cover member in sealing relationship with the distal end of the paint tray for containing and confining paint, other liquids or tools therein.

3,625,389

CONTAINER HAVING COMBINED MANWAY LID AND VENT

David H. Bartlow, Huntingdon, Pa., assignor to Owens-Corning Fiberglas Corporation

Filed Nov. 17, 1969, Ser. No. 877,346
Int. Cl. B65d *51/16*
U.S. Cl. 220—3 **4 Claims**



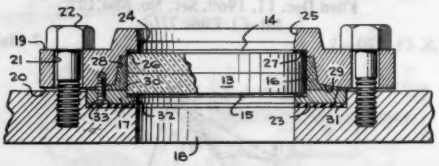
A container of hollow tubular configuration having a combined manway lid and vent. The combined manway lid and vent includes a horizontally disposed base section and a vent cap removably mounted thereon. The base section has an orifice therein and an upwardly projecting lip surrounding the orifice, the lip being adapted to receive the vent cap in close fitting relationship. The vent cap includes a vertically disposed hollow section having a sidewall with a plurality of vents and a lower edge adapted for engagement with the lip on the base section and a cover attached to the hollow section and curving down the sidewall thereof to a level below that at which the vents are present.

3,625,390

SIGHT GLASS ASSEMBLY

Charles E. Meginnis, 429 1/2 Nancy St., Charleston, W. Va.

Filed Feb. 9, 1968, Ser. No. 704,368
Int. Cl. B65d *53/06*
U.S. Cl. 220—46 R **17 Claims**



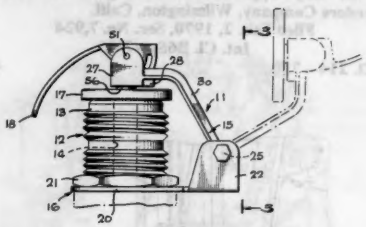
A sight glass assembly comprising housing means having an opening therethrough, a lens mounted in the opening, the opening having an inclined wall, resilient packing means interposed between the lens and the inclined wall of the opening, a faceplate disposed about the lower periphery of the lens engageable with the packing member and means for securing the faceplate to the housing means to apply a force on the packing means directed against the inclined wall of the opening in the housing means whereby the packing means is forced toward the lens to provide a compressive force about the periphery thereof.

3,625,391

CAP ASSEMBLY

Wolfgang G. Wunderlich, Saugus, Calif., assignor to The Rucker Company Roylyn Division, Glendale, Calif.

Filed Oct. 13, 1969, Ser. No. 865,912
Int. Cl. B65d *43/16*
U.S. Cl. 220—34 **7 Claims**



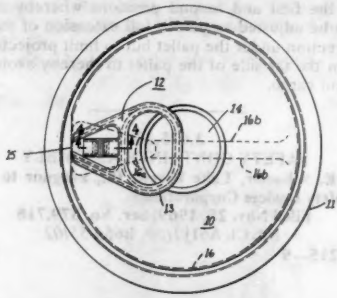
The application discloses a mounting for a cap adapted to close the end of a fitting, such as a nipple or the like, the mounting including a support, a lever pivotally mounted on the support and carrying a closure cap at one end, the lever being so mounted that when in a given position the pivoted end can move laterally of the pivotal axis, and means on the support for engaging the lever when so moved to prevent pivotal movement thereof, the closure cap having means for moving the cap relative to the lever.

3,625,392

MEANS FOR ATTACHING A PULL-TAB TO A CAN END

Elton G. Kaminski, Sidney, Ohio, assignor to The Stolle Corporation, Sidney, Ohio

Filed Mar. 16, 1970, Ser. No. 19,855
Int. Cl. B65d *17/24*
U.S. Cl. 220—54 **9 Claims**

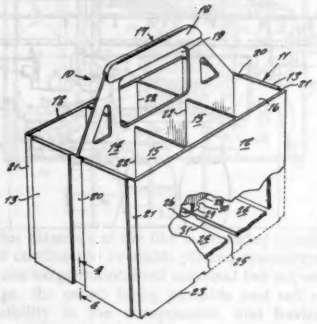


In an easy-open can, a structure is provided which eliminates the conventional tab-holding rivet. The can end proper is provided with at least one pair of integral raised abutments having mutually opposed parallel vertical walls normally to the axis of the tab, and the tab is provided with at least one curled portion normal to its axis and of a diameter to enter between said parallel vertical walls, which walls are then crimped over said curled portion to hold the tab to the can end. A reinforcing wire may be inserted in said curled portion to give it additional strength. The curled portion when firmly crimped into said abutments serves as a fulcrum for the tab when the latter is raised to perforate the can end and to tear open a panel which is defined by a scoreline. The invention applied equally to can ends provided with beverage type openings whether the tab be captive or not, and to cans wherein substantially the entire end panel is removed, and can be applied to a previously fabricated can end.

3,625,393
ONE PIECE COLLAPSIBLE PLASTIC-CARRYING CARTON

Charles J. Mittel, 1100 80th St. CT. South, St. Petersburg, Fla.

Filed June 15, 1970, Ser. No. 46,386
Int. Cl. B65d *75/00*
U.S. Cl. 220—113 1 Claim

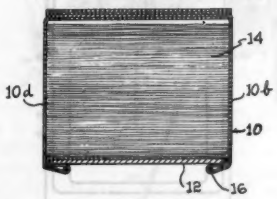


A bottle carrier of collapsible type, and having a general appearance of the conventional "six pack," the device comprising of one piece member molded out of plastic material, the device including opposite sidewalls and opposite end walls enclosing a rectangular central area divided by transverse partitions and a central longitudinal partition with a handle grasp at the upper end thereof, and a plurality of transverse extending sections comprising a bottom wall; the bottom walls being downwardly bent about a central fold line when at the same time the opposite end walls and transverse partitions are bent about vertical center fold lines so as to collapse the device into a flat shape when not in use.

3,625,394
TISSUE PACKAGE DISPENSER WITH BOTTOM AS FOLLOWER

Keith T. Bleuer, 1663 Wilshire Drive N.E., Rochester, Minn.

Filed Jan. 26, 1970, Ser. No. 5,784
Int. Cl. A47k *10/44*
U.S. Cl. 221—59 9 Claims



A package of a stack of facial tissues having a wrapping with sides of thin, flexible sheet material and with a relatively rigid base support under which the sides are drawn by an elastic band so as to maintain the wrapping tight about the tissue stack as the tissues are withdrawn from the top of the stack.

3,625,395
DISPENSER CARTON FOR NESTED ARTICLES

Oscar E. Salazar, Catia-Caracas, Venezuela, assignor to Container Corporation of America, Chicago, Ill.

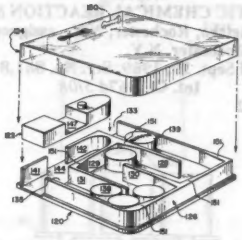
Filed Feb. 9, 1970, Ser. No. 9,527
Int. Cl. B65h *3/00*
U.S. Cl. 221—63 5 Claims

A dispenser carton for holding nested articles such as paper cups or the like. The carton includes a sleeve formed of foldably interconnected panels, each of the panels having a flap foldably connected thereto and foldable to position to define a closure element. Each flap has a weakened line to define a removable closure portion and a fixed closure portion. Upon removal of the removable part an opening is created, the edge of which engages the sides of the lowermost of the stack of nested articles.

3,625,396
DISPENSER FOR SILVER WAFER BATTERIES, AND THE LIKE

Cornelius Mark Phipps, 1001 Crescent Blvd., Glen Ellyn, Ill.

Filed Dec. 17, 1969, Ser. No. 885,704
Int. Cl. B65d *83/04*
U.S. Cl. 221—102 4 Claims



Wafer batteries, and the like, are dispensed from a storage enclosure through a narrow opening in an inner enclosure wall onto an enclosed slidable member. The slidable member receives a battery on a recess thereon which passes completely across the slidable member, and is sized to receive only one battery. The slidable member is moved to a second position in which the recess is aligned with a discharge opening in the outer wall.

A preferred embodiment provides a dispenser-storage container for new and used silver wafer batteries, e.g., hearing aid batteries, prevents inadvertent confusion of new and used batteries and yet facilitates return and salvage of valuable used batteries.

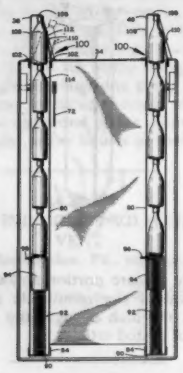
3,625,397
CONTAINER DISPLAY AND DISPENSER

George R. Shelly, Miami; Robert J. Shelley Jr., Miami; Arthur B. Dixon, W. Hollywood, and Bruce F. House, Miami, all of Fla., assignors to Shelley Manufacturing Company, Miami, Fla.

Filed Mar. 9, 1970, Ser. No. 17,811
Int. Cl. A47f *1/06*
U.S. Cl. 221—155 14 Claims

A beverage dispenser having a cartridge including a tube for holding a stack of containers, a stop spaced from one end of the tube by about the height of a container, and a spring in the tube for urging the stack of containers toward the stop and to urge the end container against the stop. The end container may be viewed for display purposes and also may be removed from the tube with the spring pushing another container against the stop. The cartridge is carried in a cart, and in this application, a plurality of the tubes are arranged side-by-side with the stop projecting above the upper surface of

the cart so that a plurality of containers are viewable at the top of the cart and can be dispensed easily from the top of the cart. A spring normally holds the containers under the stop, and the spring is yieldable to allow removal of the containers from the cartridge. A loader is provided consisting of a tube which may be inserted under the stop to release the spring, the tube carrying containers for either loading the containers into the cartridge or removing containers from the cartridge.



3,625,398

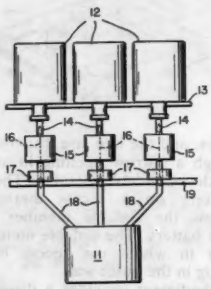
AUTOMATIC CHEMICAL REACTION SYSTEM

Andrew M. Tometsko, Rochester, N.Y., assignor to Chemtrox Corporation, Rochester, N.Y.

Filed Sept. 29, 1969, Ser. No. 861,801

Int. Cl. B67d *5/08*

U.S. Cl. 222—52 **14 Claims**



A plurality of bottles containing different chemicals are mounted in a cabinet which also contains a tape-operated mechanism that controls the opening and closing of valves that govern flow of the chemicals from the bottles to associated measuring chambers and from the measuring chambers to a reaction vessel. A time-delay mechanism comprising a pulse-generating clock, bimetallic switch arms and heating coils governs the step-by-step advance of the tape. A paddle for mixing the chemicals is rotatably mounted in the reaction vessel; and when a particulate material is used, the paddle may be foraminous and hold the particles.

3,625,399

AUTOMATIC CARBONATED BEVERAGE DISPENSING SYSTEM

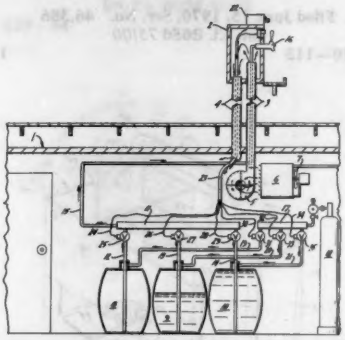
Noel D. Heisler, Wausau, Wis., assignor to Jos. Schlitz Brewing Company, Milwaukee, Wis.

Filed Feb. 3, 1969, Ser. No. 796,063

Int. Cl. B65d *5/54*

U.S. Cl. 222—76 **9 Claims**

This invention relates to an automatic beer dispensing system wherein an electrical circuit is actuated by a single selector control remote from the barrels containing the beer to simultaneously operate a solenoid valve to open a line from one barrel to a tap and another solenoid valve to open a line from a source of CO_2 gas to the barrel being tapped and to thereafter successively operate corresponding solenoid valves to supply beer from other barrels and CO_2 gas to each respective barrel then supplying the beer.



3,625,400

AEROSOL DISPENSER WITH FLEXIBLE, COMPONENT RESERVOIRS

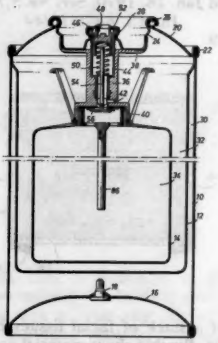
Richard Friedrich, Wassenach, Andernach, Andernacher Weg, Germany

Filed Aug. 1, 1969, Ser. No. 846,813

Claims priority, application Germany, Aug. 9, 1968, P 17 86 036.5

Int. Cl. B65d *83/14*

U.S. Cl. 222—94 **14 Claims**



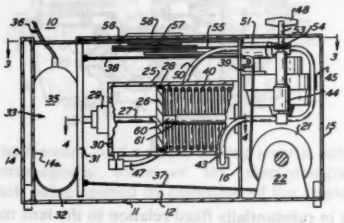
A dispenser has two separate inner containers for liquid or pasty materials which are to be mixed and dispensed together but must be stored separately. The two inner containers are flexible and are disposed in an outer container containing a propellent. A discharge valve for the mixture comprises a closure element common to both inner containers and separate closure element for one of the inner containers. On closing the discharge valve the separate closure element closes first and a mixing passage between the two closure elements is purged by the material in the other inner container. Thus no residual mixture of the two materials remains in the dispenser.

3,625,401

PUMP FOR BLOOD PLASMA AND THE LIKE

John Vaden Terry, 234 W. Valley Forge Road, King of Prussia, Pa.

Filed Nov. 20, 1969, Ser. No. 878,420
Int. Cl. B67d 35/28
U.S. Cl. 222—103 8 Claims



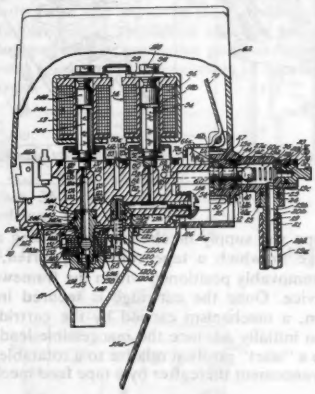
A pump for plasma and the like is provided suitable for use with but not confined to available plasma containers and with the rate of discharge maintained constant but adjustable over a wide range, the pump being portable and self-contained, with accessibility to the components, and having a fluid transferring spring-impelled piston driving a pressure plate which is manually reset by a handle for each operation. The pump is independent in operation, of temperature, weather conditions, altitude, orientation, and whether it is in motion or at rest.

3,625,402

ELECTRIC POST MIXING DISPENSING APPARATUS

Arthur W. Kulis, Morton Grove, Ill., assignor to Eaton Yale & Towne, Inc., Cleveland, Ohio

Filed Sept. 15, 1969, Ser. No. 857,692
Int. Cl. B67d 5/56
U.S. Cl. 222—129.3 8 Claims



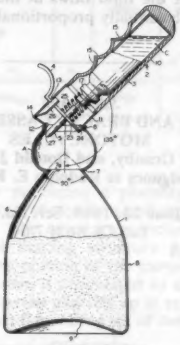
An efficient, highly serviceable fluid dispensing apparatus comprises a control valve assembly detachably connected to an inlet housing assembly by means of a quick disconnect coupling wherein the supply of fluid from the inlet housing assembly is automatically shut-off upon disconnection of the valve component. At least first and second passageways extend through the apparatus from an inlet in the inlet supply housing to an outlet in the valve assembly. Each passageway includes a check valve disposed in a first portion thereof and first and second valve means disposed in a second portion thereof. of the first valve means includes a chamber surrounding an upstanding member having a seat on its upper end about an opening into the passageway against which seat an armature movable closure disc seats and unseats to close and open the passageway. The second valve means in the first passageway is an adjustable diffuser assembly comprising a diffuser mount, a pair of telescoping opposed splash cups positioned on the mount and a stack of diffuser discs on the mount retained between the opposed cups in clamping engagement whereby variance of the pressure between the disc controls the CO_2 content of carbonated water dispensed therefrom. The second valve means in the second passageway is an adjustable metering valve having a hollow stem with an upper inlet end adapted to seat against a portion of the valve assembly body to open and close the second passageway to the flow of fluid. Controls for the first valve means allow dispensing of fluid from both passageways into a mixing spout or from the first passageway only.

3,625,403

AEROSOL-TYPE DISPENSER FOR DISPENSING A POWDERED MATERIAL

Felix Rousselot, St. Benoit, France, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Apr. 4, 1969, Ser. No. 813,642
Claims priority, application France, Apr. 5, 1968, 147102
Int. Cl. B67d 5/54
U.S. Cl. 222—193 13 Claims



An aerosol-type dispenser for dispensing a powdered material. The dispenser has a propellant container, valve means operatively associated with said propellant container for controlling release of propellant from said propellant container, and a product-containing chamber for containing the powdered material to be dispensed. A fluidization chamber is mounted on one end of said product-containing chamber and said product-containing chamber opens into it. The propellant container is mounted on said fluidization chamber and said valve means discharges into said fluidization chamber. The fluidization chamber has an outlet orifice therein, the propellant container is mounted on said fluidization chamber with the axis thereof at an oblique angle to the axis of said product-containing chamber, whereby when the dispenser is held with the product-containing chamber above the propellant-containing container, the powdered material is fed to the fluidization chamber by gravity.

3,625,404

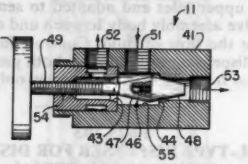
APPARATUS AND METHOD FOR DISPENSING PARTICULATE MATERIAL

Richard O. Probst, Indianapolis, Ind., assignor to Ransburg Electro-Coating Corp., Indianapolis, Ind.

Filed June 2, 1969, Ser. No. 829,206
Int. Cl. B65g 69/06
U.S. Cl. 222—193 16 Claims

An apparatus capable of dispensing particulate material and a method for accomplishing the dispensing of the material. The apparatus includes a fluid-activated means capable of causing particulate material to be withdrawn from a reservoir at a rate which is substantially proportional to the fluid flow rate in the fluid-activated means. A means for dispensing the particulate material toward an article to be coated is con-

nected to the fluid-activated means through a conduit. A fluid divider has an inlet port connected to a source of compressed fluid. The fluid divider also includes a plurality of outlet ports. One of the outlet ports of the fluid divider is connected to the reservoir to thereby provide the fluid flow which activates the fluid-activated means. Another of the outlet ports of the fluid divider is connected to the conduit to

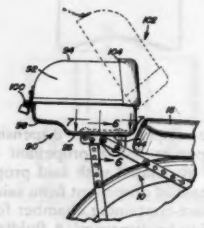


provide a fluid flow in the conduit which assists in the movement of the particulate material in the conduit toward the means which dispenses the material. The fluid divider may be a device which includes a fluid-splitting member which divides the fluid flow at the inlet port among the several outlet ports. The sum of the fluid flows at the outlet ports of the fluid divider is substantially proportional to the fluid flow at the inlet port.

3,625,405
CARRIER AND BRACKET ASSEMBLY FOR MOTORCYCLES

Newton P. Kezar, Granby, and Donald J. McCleary, Neosho, both of Mo., assignors to Rudolph E. Farber, Neosho, Mo., a part interest

Filed June 23, 1969, Ser. No. 835,549
Int. Cl. B62j 7/04
U.S. Cl. 224—32 A **11 Claims**



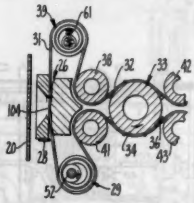
A strap assembly is provided for mounting to the rear fender of a motorcycle. The strap assembly attaches a rack thereto having a generally flat supporting surface and a pad or cushion fastened to the edge of the rack confronting the motorcycle seat to form a backrest therefor. Instead of the rack, a helmet receptacle may be connected to the strap assembly. The receptacle can be locked to prevent unauthorized opening and theft of the cyclist's helmet. The surface of the receptacle confronting the motorcycle seat is padded to serve as a backrest for a guest passenger.

3,625,406
MOTION PICTURE CAMERA AND THE LIKE

Rouel R. Campbell, 3410 Club Drive, Apt. 6, Los Angeles, Calif.

Filed Aug. 6, 1969, Ser. No. 848,007
Int. Cl. G03b 1/32
U.S. Cl. 226—52 **13 Claims**

A motion picture camera of the type which advances the film through a film gate in stop and go motion comprising a film drive mechanism having a sprocket and two guide means for forming and guiding a loop of film through a film gate, one of the guide means being mounted on an eccentric for continuous rotation while moving the loop of film against a stationary registration pin in intermittent fashion and the other guide means cooperating with the first to prevent undue slack in the loop the camera is also constructed in two sections with one section containing the film and film guide means, and the other section containing power means, a shutter and an appropriate lens system; the film gate being characterized by having a zero clearance construction and

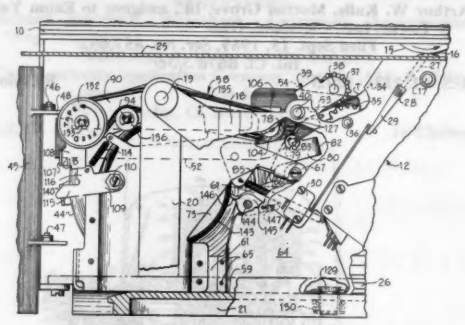


remaining in substantially fixed relation to the lens mounting; and the film drive mechanism also being formed to drive through the sprocket and the film, with the film driving the supply reel and the supply reel driving the takeup reel through a clutch mechanism and gear system providing a continuously variable drive ratio.

3,625,407
TAPE ROLL-INSERTING DEVICE

Melvin H. Norman, Oakland, and Nathaniel F. Hawthorne, Alameda, both of Calif., assignors to The Singer Company, New York, N.Y.

Filed Feb. 16, 1970, Ser. No. 11,625
Int. Cl. B65h 17/20
U.S. Cl. 226—91 **7 Claims**



A tape roll supply mechanism comprising a container or cartridge in which a tape roll is supported, the cartridge being removably positioned within the framework of a printing device. Once the cartridge is secured in an operative position, a mechanism carried by the cartridge is manipulated to initially advance the inaccessible leading end of the tape to a "start" position relative to a rotatable printing drum for advancement thereafter by a tape feed mechanism.

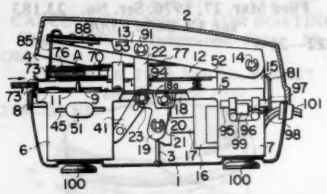
3,625,408
ELECTRIC STAPLER APPARATUS

Saichi Amakawa, Moriguchi-shi; Toshio Torigoe, Hirakata-shi; Osamu Miyamoto, Moriguchi-shi; Akito Kawamoto, Neyagawa-shi; Yasuzo Hatazaki, Asahi-ku, Osaka; Tadayuki Haruyama, Neyagawa-shi; Seiji Yokogawa, Kadoma-shi, and Hiroshi Kawai, Moriguchi-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Mar. 23, 1970, Ser. No. 21,984
Claims priority, application Japan, Mar. 25, 1961, 44/24526
Int. Cl. B25c 1/06
U.S. Cl. 227—131 **7 Claims**

An electric stapler apparatus which automatically drives staples into sheets of paper, utilizing an electromagnet to

provide the driving force. This electric stapler apparatus is an improvement over prior art apparatus of the type operative in such a manner that a microswitch is closed to energize an electromagnet when a switch lever is operated by sheets of



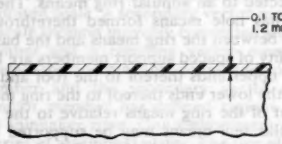
paper to be fastener, and a staple-driving lever is actuated by the electromagnetic force of the electromagnet, said microswitch being opened by operation of the staple-driving lever.

3,625,409

VINYLIDENE CHLORIDE RESIN COMPOSITION AND CONTAINER STRUCTURES MANUFACTURED THEREFROM

Nobuyuki Hisazumi; Masashi Ito, and Takao Ichii, all of Iwaki-shi, Japan, assignors to Kureha Kagaku Kogyo Kabushiki Kaisha, Tokyo-to, Japan

Filed Nov. 19, 1969, Ser. No. 878,027
Claims priority, application Japan, Nov. 19, 1968, 43/84659
Int. Cl. B65d *1/00;* **C08f** *45/38*
U.S. Cl. 229—3.5 R **2 Claims**



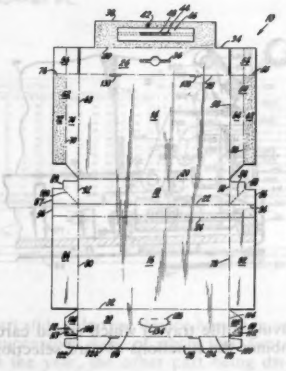
A container structure for paste or high-viscosity liquid having stretch-oriented wall and improved shape-restitution property is manufactured from vinylidene chloride resin composition containing therein a particular polyester plasticizer such as a polyester produced by the reaction of succinic acid and ethylene glycol.

3,625,410

COLLAPSIBLE CONTAINERS AND BLANK FOR MAKING SAME

Urban C. Hirschey, 36 N. Main St., Carthage, N.Y.

Filed June 18, 1969, Ser. No. 834,271
Int. Cl. B65d *5/36, 5/46*
U.S. Cl. 229—16 R **19 Claims**



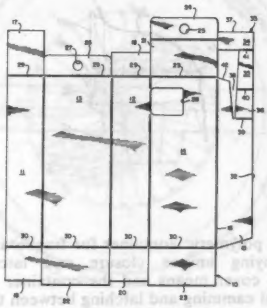
This disclosure teaches a top-loading collapsible rectangular container including a cover formed from an integral blank of sheet material and the blank from which the container is formed. The container includes a self-unfolding bottom and bottom corner construction of increased strength and an end wall and cover corner construction of increased strength.

3,625,411

CARTON AND BLANK FOR THE PACKAGING OF A PLURALITY OF USE RELATED ARTICLES

Raymond A. Cote, Charlotte, N.C., assignor to Riegel Paper Corporation, New York, N.Y.

Filed Oct. 17, 1969, Ser. No. 867,123
Int. Cl. B65d *5/02, 23/12*
U.S. Cl. 229—37 R **4 Claims**



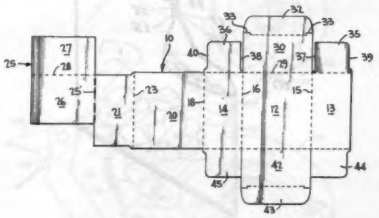
A carton tube for packaging a plurality of use related products having different dimensions and the blank for forming same is disclosed. The new carton includes an automatically set up internal bracing structure for retaining the smaller item in the top portion of the carton. The disclosed internal bracing structure is articulated to a dust flap and a sidewall panel of the carton and sets up in response to the inward folding of the dust flap during set of the carton.

3,625,412

CARTONS CONTAINING COUPONS

Charles W. Rosenburg, Jr., N. Tonawanda, N.Y., assignor to F. N. Burt Company, Inc., Buffalo, N.Y.

Filed Feb. 13, 1970, Ser. No. 11,266
Int. Cl. B65d *5/10*
U.S. Cl. 229—39 **7 Claims**

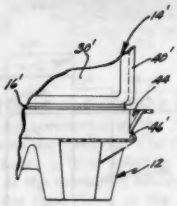


The one-piece carton blank has the usual side-face-side-face order of panels with a securing panel attached to the outward edge of one of the side panels by a hinge crease. Secured along a line of severance to the outward edge of the securing panel is a coupon panel, a hinged portion of which projects upwardly beyond the upper ends of the principal panels.

In the erected panel, the securing panel in one embodiment is of the same width as the remote side panel and is glued thereto, whereby the main portion of the coupon panel lies flat against the remote face panel. In another embodiment the securing panel is turned back medially, one-half being glued to a portion of the side panel, the coupon lying against the near face panel.

The projecting portion of the coupon panel is adapted to be folded into the top closure structure between the closure flaps of the two side panels and the closure flap of that face panel against which the main portion of the coupon panel lies.

3,625,413
EGG CARTON
Roger L. Medendorp, Grand Rapids, Mich., assignor to Gloucester Engineering Co., Inc., Gloucester, Mass.
Filed June 12, 1969, Ser. No. 832,692
Int. Cl. B65d *85/32*
U.S. Cl. 229—44 R **6 Claims**

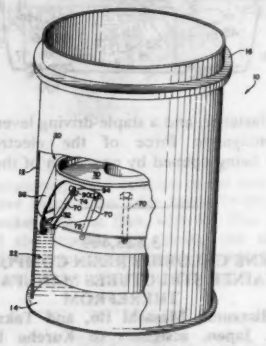


A molded polymeric container for fragile articles such as eggs, employing unique closure and latching features between the cover means and the container bottom. It involves special camming and latching between the ends of the cover means and the ends of the bottom member. The cover means has a pair of cover members with a special cooperative overcenter action during closure combined with the latching feature to obtain and maintain effective closure.

3,625,414
SEALED SURFACE SULFONATED PLASTIC-SHAPED ARTICLES
Robert J. Caiola, Fort Wayne, Ind., assignor to The Dow Chemical Company, Midland, Mich.
Continuation-in-part of application Ser. No. 818,817, Apr. 23, 1969. This application Oct. 22, 1969, Ser. No. 868,554
Int. Cl. B65d *33/16*
U.S. Cl. 229—62 **12 Claims**

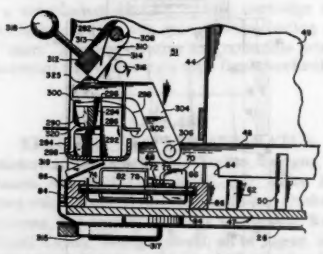
Shaped articles of thermoplastic organic polymers are sealed at temperatures below the heat distortion temperature of the polymer by (1) sulfonating at least a portion of a surface of a shaped article, (2) treating at least a portion of the sulfonated surface with a liquid which is a nonsolvent for the base polymer and a solvent for sulfonated polymer on the surface, e.g., water, (3) positioning the treated surface against another surface of surface sulfonated shaped article such that the liquid is disposed therebetween and (4) removing the liquid at temperatures below the heat distortion point of the polymer. Soaking the sealed portion of shaped article in a suitable sealing liquid releases the seal without damaging the article.

3,625,415
FLOATING ROOF SEAL
Ardell H. Nelson, and Harold A. Maeder, both of Coraopolis, Pa., assignors to Pittsburgh-Des Moines Steel Company, Pittsburgh, Pa.
Filed Mar. 27, 1970, Ser. No. 23,183
Int. Cl. B65d *45/00*
U.S. Cl. 222—26 S **5 Claims**



A floating roof seal includes an annular flexible band, the upper portion of which is connected to the roof and has a gastight seal with respect thereto. The lower portion of the band is connected to an annular ring means. The lower part of the band has hole means formed therethrough for admitting liquid between the ring means and the band from the tank. A plurality of spaced support members are loosely connected at the upper ends thereof to the roof and are loosely connected at the lower ends thereof to the ring means to permit movement of the ring means relative to the roof during use. An annular seal means may be supported by the ring means and engages the inner surface of the band. This annular seal means has hole means formed in the upper and lower parts thereof. The ring means may also be of variable size including a plurality of spring loaded relatively movable portions.

3,625,416
APPARATUS FOR THE SELECTION OF CODED ELEMENTS FILED AT RANDOM
L. Allan Cross, Jr., Lambertville, N.J., assignor to Randomatic Data Systems, Inc.
Original application Mar. 9, 1969, Ser. No. 438,216, now Patent No. 3,486,617, dated Dec. 30, 1969. Divided and this application May 9, 1969, Ser. No. 840,079
Int. Cl. G06k *1/08*
U.S. Cl. 234—48 **4 Claims**

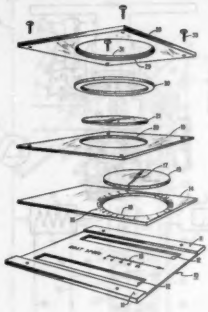


A device having a file tray in which coded cards are filed randomly combines the functions of card selection and card punching.

Cards are selected by impressing a code upon a translator which shifts appropriate selector slides into code notches formed in the cards. When cards are to be punched rather

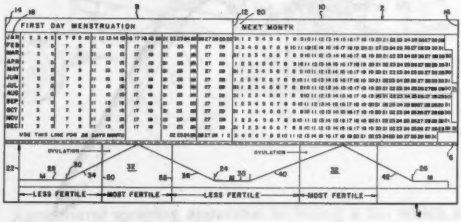
than selected, interposers individual to the several slides actuate corresponding punches to notch a card supported in a card slot outside the file tray.

3,625,417
CALCULATOR MEANS FOR BOATING
John W. Slauter, 5976 Wedgewood Drive, Mentor-on-the Lake, Ohio
Filed Oct. 6, 1969, Ser. No. 864,027
Int. Cl. G06c *1/00*
U.S. Cl. 235—61 NV **9 Claims**



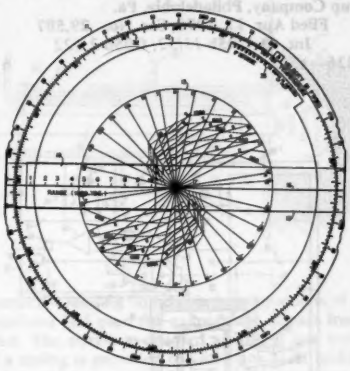
A wind velocity calculator has a primary vector member with a calibrated scale, a secondary vector member having a calibrated scale thereon movably connected with the primary vector member and a resulting vector member having a calibrated scale thereon movably connected with the primary vector member and the secondary vector member. The resulting vector member has defined regions of a pinching zone and a spinnaker zone. One embodiment of the calculator has a series of assembled plates. The two plates resting on the bottom plate have holes therein for disks to be held in the plates, these disks being rotatably held in the plates and each disk having a scale. Another embodiment has three ruler means each having a scale being pivotally and slideably connected together. Here the resulting vector member has a circular protractor means which has defined thereon a pinching zone and a spinnaker zone.

3,625,418
DEVICE FOR DETERMINING FEMALE FERTILITY PERIODS
Ernesto F. Colon, Mayaguez, P.R., assignor to The Government of the Commonwealth of Puerto Rico
Filed Nov. 3, 1969, Ser. No. 873,331
Int. Cl. G06c *3/00*
U.S. Cl. 235—85 FC **2 Claims**



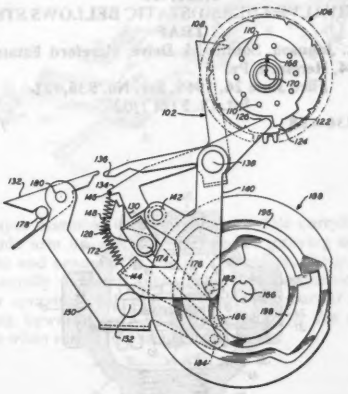
A two-part slide rule type device having in one part and on one line successive days of each two successive months throughout the year, the other part being divided into sections of greatest and less fertility. The second part is superimposed on the first with its beginning at the date of the first day of menstruation, and the divisions of the second part then indicate the dates of the periods of greatest and less fertility.

3,625,419
SONAR SLIDE RULE
Daniel Barron, 9326 Edmonston Road, Greenbelt, Md.
Filed Apr. 30, 1970, Ser. No. 33,399
Int. Cl. G04b *37/00*
U.S. Cl. 235—88 **3 Claims**



This device is for determining the sonar range to an underwater target by a sonar operator. The device comprises a plurality of discs operative relative to each other in a relationship which is a function of thermal conditions, type of equipment, wave height, probability of detection and other oceanographic conditions to determine sonar range.

3,625,420
TRANSFER MECHANISM
Kenneth F. Oldenburg, Arcadia, Calif., assignor to Litton Industries, Inc., Beverly Hills, Calif.
Filed Sept. 14, 1970, Ser. No. 71,902
Int. Cl. G06c *15/26*
U.S. Cl. 235—137 **13 Claims**



A business machine such as an adding machine, cash register, or the like is provided with two accumulators which have respective sets of registers which are interleaved with one another and which are mounted on the same shaft. U-shaped bails interconnect lower order registers with associated registers representing higher digital orders. Camming surfaces and additional mechanisms operating on

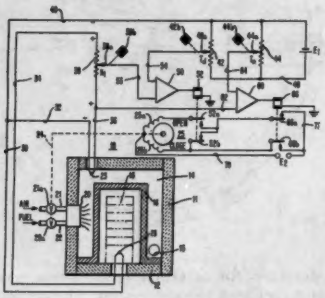
each transfer bail condition the bails to provide carries under appropriate conditions as the entire accumulator assembly is moved from its operating position to its rest position. By these arrangements, positive, simultaneous transfers are accomplished subsequent to the entry of digital information, in both of the two interleaved accumulators.

3,625,421

SYSTEM FOR CONTROLLING FURNACE TEMPERATURES WITHOUT OVERSHOOT

James L. Garrison, Hatboro, Pa., assignor to Leeds & Northrup Company, Philadelphia, Pa.

Filed Apr. 17, 1970, Ser. No. 29,587
Int. Cl. G05b *11/32*; G05d *23/22*
U.S. Cl. 236—15 B **6 Claims**



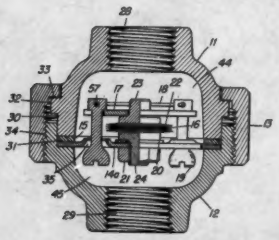
A temperature control system for an annealing furnace which controls to maintain a weighted average of the furnace temperature and the work temperature equal to the desired work temperature. The weighting of the average is such that the maintenance of the average in equality with the desired work temperature operates to maintain the furnace temperature so related to the work temperature as to provide an optimum heating rate for the avoidance of overshoot.

3,625,422

MULTIVALVE THERMOSTATIC BELLOWS STEAM TRAP

Harold L. Johnson, Southwick Drive, Hereford Estates, P.O. Box 134, Hereford, Pa.

Filed June 26, 1969, Ser. No. 836,921
Int. Cl. F16t *1/02*
U.S. Cl. 236—58 **7 Claims**



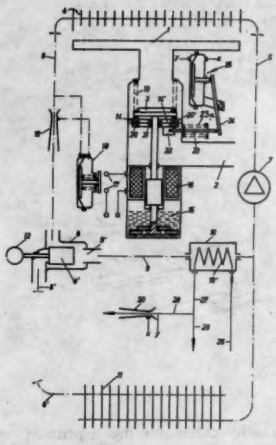
This invention is a steam trap having a thermostatic type of bellows with two or more discharge valves operated by a single bellows. The trap may also have a flexible valve operating bridge.

3,625,423

GAS-HEATED HOT WATER HEATER

Hans Meier, Remscheid, Germany, assignor to Joh. Vaillant KG, Remscheid, Germany

Filed Mar. 9, 1970, Ser. No. 17,500
Claims priority, application Germany, Mar. 21, 1969, P 19 14 463.9
Int. Cl. F24d *3/08*
U.S. Cl. 237—8 **9 Claims**



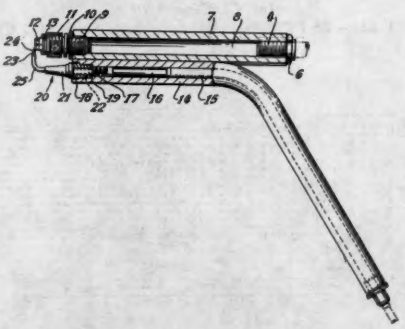
A shutter valve is located in the gas supply conduit of the gas burner of a water heating apparatus having several taps from which domestic water may be drawn. A venturi in the line leading to one of the taps produces a pressure differential in response to flow through that line. A diaphragm-type actuator is connected to the venturi and to the shutter valve to reduce the gas flow to the burner when that pressure differential occurs.

3,625,424

APPARATUS AND METHOD FOR CONVERTING A PRESSURE-SUPPLIED SPRAY GUN INTO AN ELECTROSTATIC SPRAY GUN

Arthur Charles Mantica, Epsom, Surrey, England, assignor to Volstatic Limited, London, England

Filed May 22, 1969, Ser. No. 826,907
Int. Cl. B05b *5/00*
U.S. Cl. 239—3 **10 Claims**

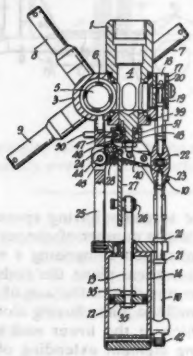


The invention described relates to an attachment to or adaptation of an existing spray gun which converts it into an electrostatic spray gun, by providing an electrically insulating extension of the original gun and an electrostatic supply thereto.

3,625,425
TANK WASHERS

Michael Robinson, Worcestershire, England, assignor to Streamfisher Limited, St. Peter Port, Guernsey, England

Filed July 28, 1970, Ser. No. 58,960
Claims priority, application Great Britain, July 29, 1969, 38,049/69
Int. Cl. B05b 3/00
U.S. Cl. 239—227 21 Claims

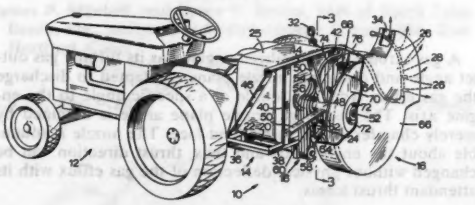


A device for washing the inside of a tank, vat or other container using cleansing liquid under pressure, the device comprising a base intended to be rotatably mounted, in the use of the device, on a pipe carrying a supply of the cleansing liquid, and also comprising at least one nozzle pivotably mounted on the base in such a way that the or each nozzle is connected to the interior of the pipe, and wherein the or each nozzle is oscillatable in a plane transverse to that in which the base rotates, the or each nozzle being oscillatable by means of a piston and cylinder assembly, and wherein the base is rotatable about the pipe by a one-way drive mechanism secured to the end of said pipe and actuated by the nozzle or nozzles.

3,625,426
AGRICULTURAL SPRAYING APPARATUS

Ely Swanson, 169 Bruce Street, Thornbury, Ontario, Canada

Filed Apr. 7, 1970, Ser. No. 26,388
Int. Cl. A01n 17/08
U.S. Cl. 239—77 11 Claims

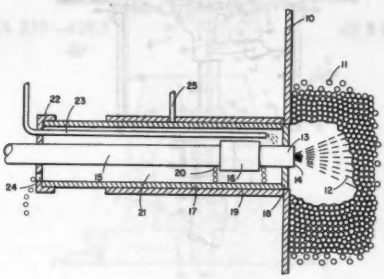


Agricultural spraying apparatus including a fan which inspires air axially and expels the air together with a liquid spray radially. The fan includes an impeller having a longitudinal extent substantially less than that of a fan casing so that as the impeller compresses air, the pressures in the air tend to equalize in the space between the fan and the casing before the air is displaced through the outlet. To facilitate assembly, contoured surfaces on the impeller and casing are engaged to locate the ring in relation to the impeller.

3,625,427
LIQUID FEED SYSTEM FOR FLUIDIZED BEDS

Ravindra Nadkarni, Cambridge; Frank J. Tremblay, Dracut, and Charles L. Kusik, Winchester, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Feb. 25, 1970, Ser. No. 13,904
Int. Cl. B05b 9/00
U.S. Cl. 239—124 3 Claims

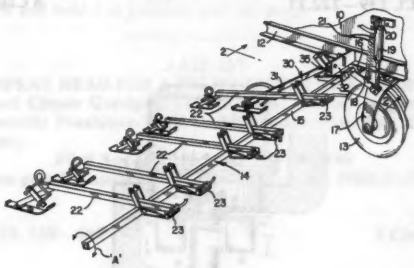


Apparatus for feeding liquid solutions by means of a nozzle into a fluidized bed used for evaporating liquids from solids in solution. The nozzle is coupled to a feed line outside the bed and a casing is provided to catch any fluid leaking from the coupling, thus preventing any fluid from leaking into the fluidized bed thereby helping to insure controlled chemical and physical properties in the solid particles thus produced.

3,625,428
SWING AWAY GUIDE ARM

Charles D. Mecklin, Memphis, Tenn., assignor to International Harvester Company, Chicago, Ill.

Filed Nov. 24, 1969, Ser. No. 879,051
Int. Cl. B05b 1/20
U.S. Cl. 239—166 2 Claims



A sprayer assembly incorporating a nozzle carrying swing away guide arm on a mobile carrier for spraying operation proximate and beneath the carrier's structure, the guide arm being pivotally mounted such that it can be positioned for optimum spraying operation proximate the carrier and yet will swing upwardly and away from beneath the carrier's structure when raised to a transport position.

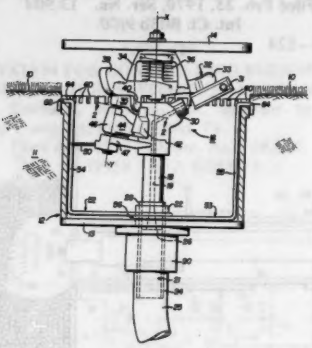
3,625,429
LAWN SPRINKLER HEAD

Devere Turrell, 22125 Grand Lake, St. Clair Shores, Mich.

Filed Sept. 21, 1970, Ser. No. 73,899
Int. Cl. B05b 3/08
U.S. Cl. 239—206 6 Claims

A reversible short and long stroke impact sprinkler head of the popup type normally recessed in a housing set in the ground adapted to popup when water pressure is turned on;

the improvement providing a rotatably adjustable cam member disposed laterally along the inner sprinkler housing



wall, and a striker pin attached to a pivot member which extends radially outwardly to strike against the cam member.

3,625,430

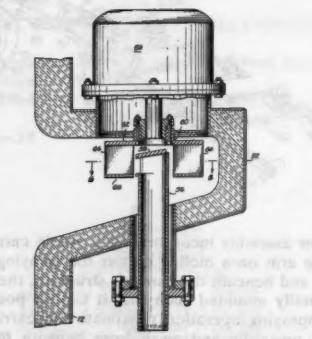
METHOD AND APPARATUS FOR CLEANING CONTAMINATED GASES

Orlan M. Arnold, Grosse Point Park; Victor W. Hanson, Garden City; Robert M. Jamison; Nicholas J. Panzica, both of Detroit, and Emil Umbricht, Northville, all of Mich., assignors to Ajem Laboratories, Inc., Livonia, Mich.

Original application Apr. 8, 1968, Ser. No. 719,767, now Patent No. 3,475,881, dated Nov. 4, 1969, which is a continuation of application Ser. No. 586,812, Nov. 14, 1966, now abandoned. Divided and this application May 14, 1969, Ser. No. 844,695

Int. Cl. B05b *3/02*; F23d *11/04*

U.S. Cl. 239—222.11 **8 Claims**



A segmentally directed rotary spray generator for creating a high-velocity intense liquid spray having a definite arcuate shape with a relatively substantial effective depth useful with air pollution control equipment. The rotary spray generator having a plurality of blades symmetrically arranged radially on a rotatable ring support structure and a liquid supply pipe fitting within the ring structure having an angular orifice opening approximately equal to the angular segment of the spray to be generated.

3,625,431

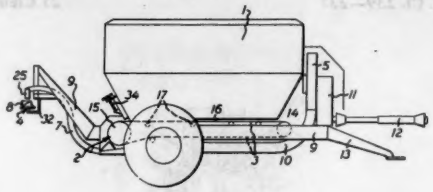
ARTIFICIAL MANURE SPREADER

Alf Helmer Andersson, Ystad, Sweden, assignor to Ystads Gjuteri & Mekaniska Verkstads Aktiebotag, Ystad, Sweden

Filed Jan. 20, 1970, Ser. No. 4,278

Int. Cl. B05b *3/04*

U.S. Cl. 239—222.17 **4 Claims**



An artificial manure spreader having spreader means including an ejector fan and a number of conveying pipes from the fan to spreader units each comprising a rotational body having an inclined diametrical plane the ends of said plane being disposed each on one side of the axis of rotation of the rotational body, said inclined plane having along one longitudinal edge a wing which at the lower end of the inclined plane merges in a wing element extending obliquely to the main plane of the wing and inwardly over the inclined plane.

3,625,432

APPARATUS FOR DEFLECTING GAS TURBINE ENGINE EXHAUST GASES

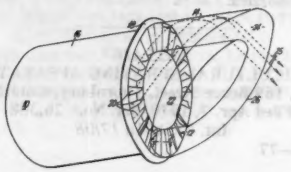
Stephen L. Bragg, Findern, England, assignor to Rolls Royce Limited, Derby, England

Filed Jan. 22, 1970, Ser. No. 5,016

Claims priority, application Great Britain, Jan. 31, 1969, 5,544/69

Int. Cl. B64c *15/04*

U.S. Cl. 239—265.35 **7 Claims**



A gas turbine jet propulsion engine has its turbine gas outlet angle and discharge nozzle plane coadapted to discharge the gas efflux from the nozzle at a specific angle to the engine axis. The discharge nozzle plane angle is obtained by merely chamfering the nozzle end face. The nozzle is rotatable about the engine axis and thus, thrust direction can be changed without physical deflection of the gas efflux with its attendant thrust losses.

3,625,433

INSECTICIDE APPLICATOR FOR GRAIN BINS

Vaughn I. Moss, 1005 Nebraska, and Garth A. Sharp, 1301 Nebraska, both of Mound City, Mo.

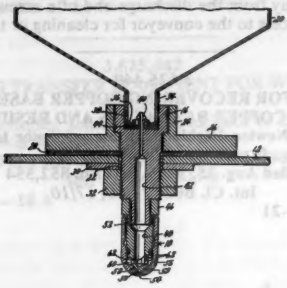
Filed Nov. 5, 1969, Ser. No. 874,333

Int. Cl. A62c *31/22*

U.S. Cl. 239—271 **2 Claims**

An insecticide applicator for grain bins consisting of a pipe nipple fixed in a portion of said bin to establish communication between the interior and exterior thereof, a nozzle affixed to the inner end of said nipple and positioned centrally

over the grain surface of said bin, and a pressurized insecticide container adapted to be interconnected with the exter-



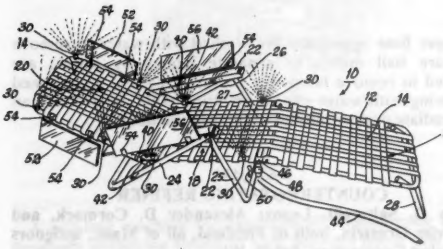
nal end of said nipple, said nozzle being adapted to apply said insecticide uniformly over the grain surface in said bin.

3,625,434

DEVICE FOR SUNBATHING HAVING WATER-SPRAY-COOLING MEANS

Earl R. Kitover, 6627 N. Lawndale Ave., Lincolnwood, Ill.

Filed Apr. 30, 1970, Ser. No. 33,383
Int. Cl. B05b *17/00*
U.S. Cl. 239—289 **7 Claims**



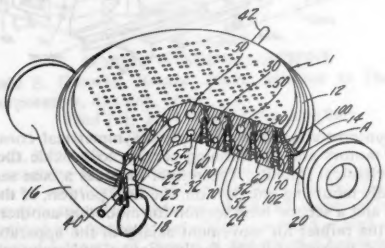
A sunbathing system is provided in which a lounge chair having a tubular frame construction carries a number of water nozzles along the frame. The water nozzles have an outlet spray pattern to direct a fine water spray toward a person lying in the lounge chair when a water hose is operatively connected to the tubular frame.

3,625,435

DUAL ORIFICE QUADRUPLET IMPINGEMENT INJECTOR

James P. Mitchell, and Bruce T. Brown, both of North Palm Beach, Fla., assignors to United Aircraft Corporation, East Hartford, Conn.

Filed Feb. 14, 1967, Ser. No. 617,762
Int. Cl. F23d *11/16*
U.S. Cl. 239—422 **8 Claims**



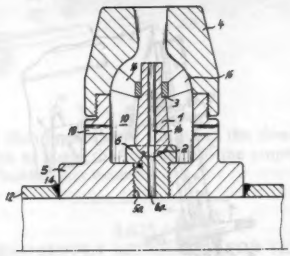
An injector head for two propellants wherein the propellants are fed through internal passageways in the injector head and are ejected from the face of the injector in a quadruplet pattern of openings. The invention herein described was made in the course of or under a contract with the Department of the Air Force.

3,625,436

DEVICE FOR ATOMIZING LIQUID

Karl-Heinz Wirths, Menzinger Str. 36, 8 Munich 19, Germany

Filed Dec. 19, 1969, Ser. No. 886,549
Int. Cl. E03c *1/08*
U.S. Cl. 239—428.5 **8 Claims**



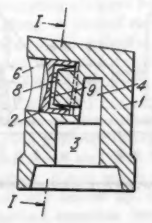
A device for atomizing liquid, particularly sulfite liquor which is adapted to be burnt after it is atomized, includes a housing formed of upper and lower parts, the lower part being connectable to a feed pipe for the liquid to be atomized and having a threaded bore which carries an insert with a liquid flow passage therethrough. The upper part of the housing carries a support which extends into a vapor chamber defined by the interior of the upper and lower parts and which supports a liquid nozzle on a recess of the insert in a manner such that the flow passage of the nozzle is aligned with the flow passage of the insert. The insert is preferably provided with a hemispherical recess to permit the pivotal arrangement of the nozzle thereon and the alignment of the passages. The supports defined by the upper part include radial support fingers which hold a central annular collar which is adapted to engage around the upper portion of the nozzle and hold it in position over the insert.

3,625,437

SPRAY HEAD FOR A PRESSURIZED CONTAINER

Gerard Claude Garrigou, Ville D'Avray, France, assignor to Deutsche Prazisions-Ventil GmbH, Hattersheim/Main, Germany

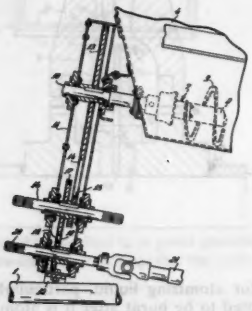
Filed Aug. 21, 1969, Ser. No. 851,830
Claims priority, application Germany, Aug. 24, 1968, P 17 75 543.0
Int. Cl. B05b *1/34*
U.S. Cl. 239—469 **7 Claims**



A spray head for a pressurized container, said head having a recess and a pin extending from the bottom of the recess, and also having a cup-shaped nozzle insert which is inserted into the recess and placed over the pin, the end of the pin and the bottom of the insert resting against the pin defining a swirl-chamber system, and the outer lateral surface of the insert together with the lateral surface of the recess forming a

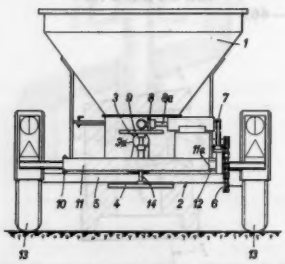
first pair of cooperating surfaces, while the inner lateral surface of the insert together with the lateral surface of the pin forms a second pair of cooperating surfaces.

3,625,438
SPREADING IMPLEMENTS WITH VARIABLE DRIVE
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland, and Ary van der Lely, 10 Weverskade, Maasland, Netherlands
Filed Dec. 4, 1969, Ser. No. 882,229
Claims priority, application Netherlands, Dec. 13, 1968, 6817892
Int. Cl. A01c 19/00
U.S. Cl. 239—670 18 Claims



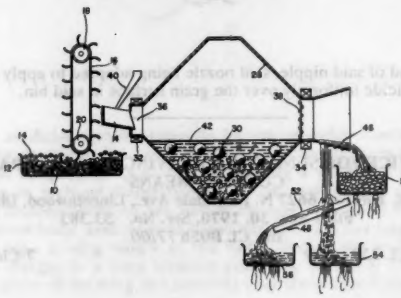
A spreading implement including a hopper supported on a wheeled frame, a spreader located at the lower portion of the hopper below an outlet port and a feeding member within the hopper to urge granular or powdery material towards the outlet port. A transmission is connectable to a power takeoff and has several coupling points to power the feeding member at different speeds while the spreading member can be rotated at the same speed from either coupling point. In one embodiment, the feeding member can be clutched inoperative.

3,625,439
VEHICULAR TRAILER HAVING FLUENT MATERIAL DISTRIBUTION MEANS
Hans Gisler, Bern, Switzerland, assignor to Firma Marcel Boschung, Ried, Schmitten, Canton, Fribourg, Switzerland
Filed Dec. 30, 1969, Ser. No. 889,076
Claims priority, application Switzerland, Jan. 14, 1969, 453/69
Int. Cl. A01c 17/00
U.S. Cl. 239—684 2 Claims



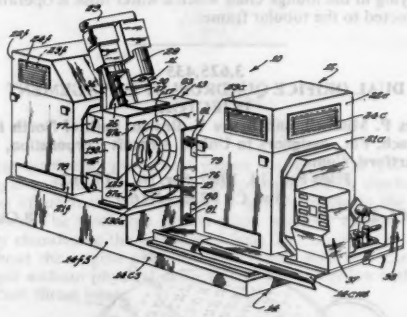
A vehicular trailer is disclosed particularly adapted for distributing fluent material such as salt or sand or the like upon a roadway or other surface, wherein the slinger plate is rotatably driven by means of a pair of friction wheels disposed with their axes at right angles to each other. One of the wheels is adjustable axially with respect to the other of the wheels, whereby the rotational speed of the slinger plate may be substantially continuously adjusted regardless of the rotational speed of the driving means. The slinger plate is mounted upon a horizontally swingable arm so as to be swingable away from the discharge end of a screw conveyor, permitting access to the conveyor for cleaning or the like.

3,625,440
METHOD FOR RECOVERING COPPER BASE METAL FROM COPPER BASE ASHES AND RESIDUES
Irving Bond, Newton Highlands, Mass., assignor to Bay State Smelting Co., Inc., Somerville, Mass.
Filed Aug. 25, 1969, Ser. No. 852,554
Int. Cl. B02c 21/00, 17/10
U.S. Cl. 241—21 1 Claim



Copper base aggregates are washed with water to remove dust, are ball milled to separate oxides by shock, are screened to remove lumps for reprocessing and are cleaned by flowing with water over a vibrating table, to produce an intermediate copper base product for remelting.

3,625,441
COUNTERROTATING REFINER
Martin O. Saltarelli, Lenox; Alexander D. Cormack, and Charles Ornstein, both of Pittsfield, all of Mass., assignors to Beloit Corporation, Beloit, Wis.
Filed Sept. 29, 1969, Ser. No. 861,581
Int. Cl. B02c 7/06, 7/14, 25/00
U.S. Cl. 241—37 16 Claims



A counterrotating refiner employs symmetrical construction of motors and the refining section to provide thermal and mechanical stability. The refiner includes a base section for fixedly mounting one portion, the feed portion, of the apparatus and a second base section for mounting another portion of the refiner for movement axially of the apparatus on controlled bearing surfaces for inspection and maintenance, and to provide for axial motion of one end of the refiner to eliminate stress concentrations upon expansion due to an in-

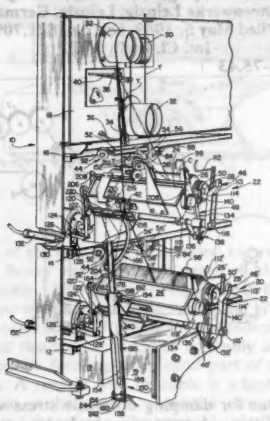
crease in temperature. The refiner also employs structure for sealing nonparallel flanges of the refining chamber while maintaining the refining discs in a parallel relationship to prevent distortion of the frame of the refiner.

3,625,442

STRAND TRANSFER EQUIPMENT FOR WINDING MACHINE

Joseph E. DiMeglio, Johnston, R.I., assignor to Leesona Corporation, Warwick, R.I.

Filed July 30, 1968, Ser. No. 748,792
Int. Cl. B65h *54/00*
U.S. Cl. 242—18 A **9 Claims**



A winding machine for automatically transferring a continuously advancing strand of yarn between upper and lower winding heads. In order to transfer winding of the yarn from the lower head to the upper head, a guide wheel is moved into engagement with the advancing strand and reroutes it into position for attachment to the upper head. Then a transfer arm is actuated and moves the rerouted yarn so that it is attached to the upper winding head for winding thereon, whereupon the yarn is cut and the tail of the cut yarn winds onto the lower head which may then be stopped and doffed. The strand of yarn is advanced downwardly from above the heads and in order to transfer the strand from the upper head to the lower head, a vertically moving arm first actuates a fanning interceptor which holds a run of the strand against traversing movement whereupon a guide wheel on the vertical arm engages this run of the strand and lowers it into position adjacent the lower head for engagement by a guide wheel which reroutes the advancing strand for subsequent engagement by a transfer arm and cutter, as previously described, whereupon the upper head may be stopped and doffed.

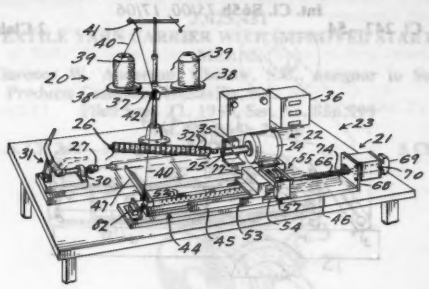
3,625,443

BOBBIN WINDING MACHINE

Ronald S. Knowles, Romeo, Mich., assignor to The Kemp Corporation, Armada, Mich.

Filed July 25, 1969, Ser. No. 844,863
Int. Cl. B65h *54/12*
U.S. Cl. 242—18 A **7 Claims**

A machine for winding measured lengths of thread onto a series of identical bobbins or the like. The machine has a removably mounted arbor on which the empty bobbins are assembled in adjacency and which is rotated at high speed. A continuous length of thread is fed to the bobbins over a thread guide that slides along ways parallel to the axis of the arbor. When each bobbin is filled, a thread guide indexing mechanism is actuated to advance the thread guide two bobbin widths for flipping the thread off of the bobbin just



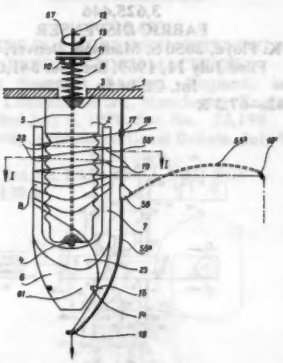
wound and then immediately to retract the thread guide one bobbin width to guide the thread onto the empty bobbin adjacent that bobbin just wound.

3,625,444

THREAD SUPPLY APPARATUS FOR TEXTILE MACHINERY

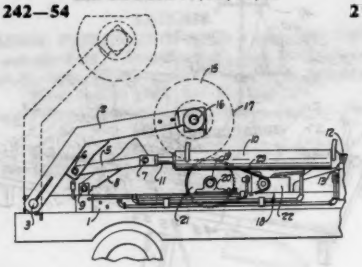
Charles George Hatay, Schaffhausen, Switzerland, assignor to Firma Fouquet-Werk Frauz & Plank, Rottenburg/Necker, Germany

Filed July 29, 1970, Ser. No. 58,978
Claims priority, application Germany, Jan. 28, 1970, P 20 03 760.9
Int. Cl. B65h *51/20*
U.S. Cl. 242—47.01 **30 Claims**



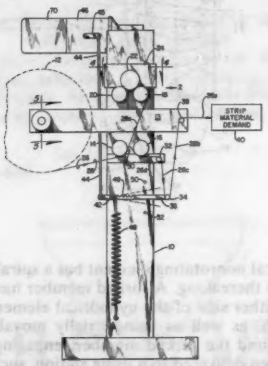
A cylindrical nonrotating element has a spirally progressive track formed therealong. A forked member has two tines extending on either side of the cylindrical element, and rotatable therewith, as well as being axially movable. Thread is threaded around the forked member, engaging in the spiral track, and then delivered to a using station, such as a knitting position. Upon rotation of the forked member, the thread will engage in the spiral grooves; the spiral grooves will cause spacing of the thread along the tines until an end position is reached at which point, if too much thread is wound along the tines, the thread will bunch up, causing increased axial pull, moving the forked member from the rotating thread supply; when a sufficient number of threads have been taken off the tines so that the axial pull will be overcome by a counteracting spring, the tines will again engage, causing rotation of the forked thread supply member to wind more thread on the tines. The drive can be external, or internal of the cylindrical member by individual motors, the tines can be supported from the bottom, or top of the cylindrical member and various constructions are shown.

3,625,445
DRIVE SPOOL CONSTRUCTION
Fred C. Hall, 820 Sharon Park Drive, Menlo Park, Calif.
Filed June 17, 1969, Ser. No. 833,915
Int. Cl. B65h *75/00, 17/06*
U.S. Cl. 242—54 2 Claims



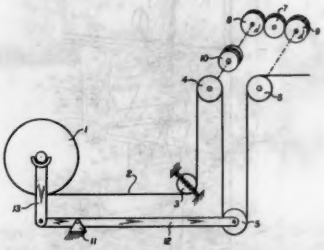
The disclosure herein relates to reel driving mechanism and particularly to the actual drive arrangement which is intended to increase the life of the various components as to the usual phases thereof by making possible the adjustment of the actual drive wear surfaces with respect to reel end peripheries so that long life is obtained by shifting the wear surfaces to uniformly provide for the wear thereof. The arrangement is best availed of in a reel driving mechanism wherein the reel is lifted into position and by suitable arrangement possibly forcibly engaged with the friction drive surface, thus accentuating wear under some circumstances, but since the wearing surfaces are adjustable with respect to the drive imposed thereupon, such surfaces can be most usefully availed of and the lives extended thereby.

3,625,446
FABRIC DISPENSER
Frederick K. Floyd, 2050 S. Madison, Denver, Colo.
Filed July 11, 1969, Ser. No. 841,082
Int. Cl. B65h *17/02*
U.S. Cl. 242—67.3 R 10 Claims



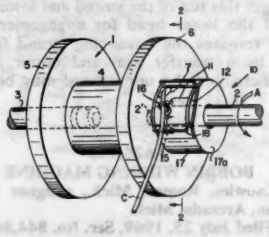
Apparatus for removing a flat strip of material from a flat strip of liner to which it is adhered and dispense the material under low and substantially constant outgoing tension irrespective of the velocity and acceleration of outgoing demand for the material, adhesiveness of the material, or diameter or width of a roll supply of same, characterized by a tension-establishing, spring-urged member which senses changes in velocity of the outgoing material and feeds the change signal to a variable-speed transmission to vary its speed accordingly to synchronize material velocity approaching and leaving the spring-urged member which remains within a range of motion to maintain substantially constant tension. A liner stripping system is employed which varies the angle of wrap around a stripper roll which increases stripping force with increase in adhesiveness between the material and liner. A friction torque is also applied to a roll supply of the material and its liner which automatically varies with the change of weight resulting from reduction of diameter of the supply to maintain substantially constant tension in the material and liner leaving the supply and to prevent the supply from overruning during deceleration. One example of the use of the apparatus resides in feeding the outgoing material to a variable-demand device, such as a machine for applying cover material to a power transmission belt.

3,625,447
APPARATUS FOR CONTROL OF WEB TENSION IN MULTICOLOR PRINTING MACHINES
Dietrich Hank, Leipzig, Germany, assignor to Veb Druckmaschuenwerke Leipzig, Leipzig, Germany
Filed May 5, 1969, Ser. No. 821,709
Int. Cl. B65h *25/22*
U.S. Cl. 242—75.43 1 Claim



An apparatus for damping of tensile stress variations and for control of the web tension on braked unwinding devices for webs of flexible material, as paper, plastic foils, and the like, which comprises a dancer roller disposed between a first feeding roller and a second feeding roller. The first feeding roller is arranged on the roller side and serves as a moment compensation device. The second feeding roller serves as a feeding device for the web. A gear is provided for driving the first feeding roller, and a slip coupling is operatively disposed between the first feeding roller and the gear.

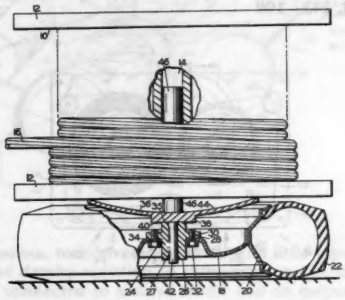
3,625,448
SCRAP TAKEUP
Rodney J. L. Griffiths, 4375 Avalon Street, Pierrefonds, Quebec, Canada
Filed Apr. 28, 1969, Ser. No. 819,566
Int. Cl. B21c *47/04*; B65h *75/28*
U.S. Cl. 242—78 9 Claims



Means for coiling cable and automatically separating defective cable at the leading end from the good remainder, comprising a rotatable main cable takeup reel and a rotatable auxiliary cable takeup reel coaxial therewith. Guide means permits the free passage of cable from the main to the auxiliary reel until good cable reaches the auxiliary reel, whereupon the two reels are rotated and the guide means entrains

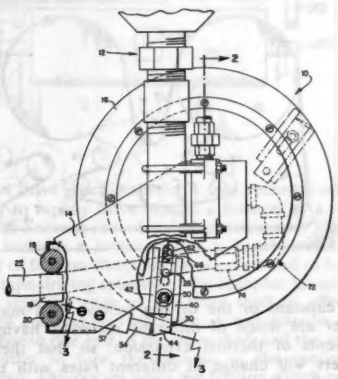
the cable so that good cable is wound on the main takeup reel and defective cable is simultaneously wound on the auxiliary takeup reel.

3,625,449
REEL-HOLDING STAND
Perry E. Landsem, 45255 E. River Drive, Milwaukie, Oreg.
Filed June 18, 1969, Ser. No. 834,351
Int. Cl. B65h *75/34*
U.S. Cl. 242—85 **2 Claims**



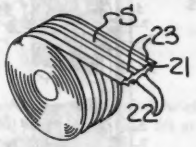
The stand of the invention is intended to provide rotatable support for heavy reels such as reels of electric wire or telephone cable. The stand comprises a base having a peripheral tire member which serves as the ground-engaging member. A central socket member is removably secured to the base, and this socket member rotatably and detachably receives a spindle forming an integral part of a reel-supporting platform. A reel of wire or cable is adapted to be positioned flatwise on the platform, and the wire or cable can be freely unwound therefrom. The rotatable platform has an upwardly extending post for holding a reel on the platform. The base and inflated peripheral member may comprise a conventional wheel and tire.

3,625,450
HOSE REEL WITH POSITIVE STOP
Otis S. Lloyd, Jr., Lansdale, Pa., assignor to William M. Wilson's Sons, Incorporated, Lansdale, Pa.
Filed Sept. 22, 1969, Ser. No. 859,896
Int. Cl. B65h *75/34*
U.S. Cl. 242—86 **7 Claims**



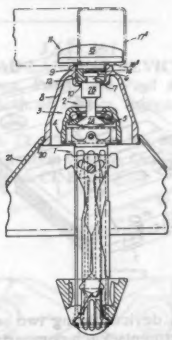
A hose reel is provided with a mechanism for positively stopping the reel from turning and playing out the remainder of the hose and for absorbing the shock as the hose is stopped near its end. The mechanism comprises a spring-loaded finger which engages a spring-biased plunger prior to complete unwinding of the hose.

3,625,451
TEXTILE YARN CARRIER WITH IMPROVED STARTING MEANS
Clarence W. Anderson, Cheraw, S.C., assignor to Sonoco Products Company, Hartsville, S.C.
Filed Sept. 11, 1969, Ser. No. 856,999
Int. Cl. B65h *75/28*
U.S. Cl. 242—125.1 **5 Claims**



A textile yarn carrier comprising a core having a yarn-supporting surface and a yarn-receiving groove disposed in the supporting surface and extending at least partially around the core and a yarn catch insert mounted within the groove for facilitating starting of the winding of a package of yarn. Preferably, the insert comprises a base, a plurality of barbs extending outwardly from the base at an acute angle upwardly of the groove and engaging the core for securing the insert within the groove and a plurality of yarn-catching fingers extending outwardly from the base at an acute angle downwardly further within the groove to define a yarn pinch area between the base and each of the yarn-catching fingers.

3,625,452
HOLDERS FOR BOBBINS IN SPINNING AND PREPARATORY MACHINES
John Michael Noguera, London, England, assignor to Casablancas Limited, Salford, Manchester, England
Filed July 6, 1970, Ser. No. 52,198
Claims priority, application Great Britain, July 9, 1969, 34,672/69
Int. Cl. B65h *49/02*; **D03j** *5/08*
U.S. Cl. 242—130.2 **7 Claims**



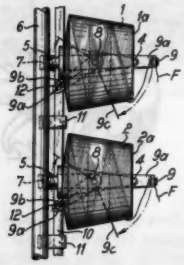
A bobbin holder and an associated suspension member for suspending the bobbin holder from a creel rail having a slotted base, the bobbin holder and the suspension member being connected together to form a unit that can be releasably attached to such a creel rail without disassembling the unit.

3,625,453

DEVICE FOR READYING THREAD ENDS OF SUPPLY COILS IN A CREEL FOR TEXTILE MACHINES

Stefan Furst, 20 Peter-Nonnenmuehlen-Allee, Moenchengladbach, Germany

Filed May 7, 1968, Ser. No. 727,155
Claims priority, application Germany, May 13, 1967, R 46016
Int. Cl. B65h *49/02*; D02h *1/00*; D03j *5/08*
U.S. Cl. 242—131 **7 Claims**



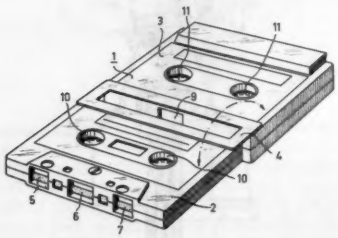
Device for readying a thread end of supply coils arrayed in a creel for textile machines so that a respective end surface of the coils faces in a given forward direction includes a thread holder movably mounted for adjustment to a position in front of the end surface of a respective supply coil mounted in the creel in place of a previously depleted coil wherein the thread end of the space coil is accessible for insertion in the thread holder so as to be readied for subsequent processing, and, after removal of the thread end from the thread holder, to a position located outside of a geometric form defining a longitudinal extension of the peripheral surface of the respective supply coil.

3,625,454

TAPE CARTRIDGE DEVICE

Johan Van Der Maaden, and Hulbert Engel Van Lit, both of Emmasingel, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 19, 1969, Ser. No. 800,429
Claims priority, application Netherlands, Feb. 23, 1968, 6802575
Int. Cl. G11b *23/10*
U.S. Cl. 242—180 **2 Claims**



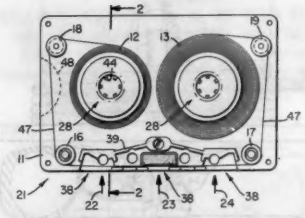
A tape cartridge device having two separate tape storing and carrier compartments, each compartment being provided with tape carrier means such as winding and unwinding cores. The separate compartments are disengageable one from the other and connected as by a hinge so that one of the compartments may be pivoted to a desired angle with respect to the other compartment. One of the tape carrier compartments is arranged for storing and playback of acoustical signals, while the other compartment is arranged for storing and playback and/or recording of optical signals such as on video tape or film. The separate compartments or tape magazines may be provided with means to synchronize the playback and/or recording of the tape carried in each of the separate compartments. The hinged magazine arrangement is particularly suitable for use in an audio-visual recording and/or playback device.

3,625,455

TAPE CASSETTE

John H. Streets, Redwood City, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Nov. 19, 1969, Ser. No. 877,932
Int. Cl. G03b *1/04*; G11b *15/32, 23/04*
U.S. Cl. 242—199 **8 Claims**



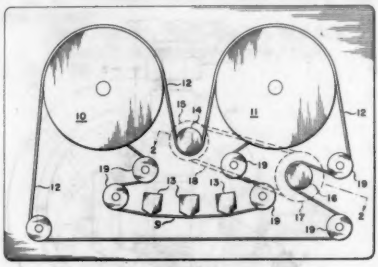
A tape cassette is provided with a precision baseplate for engaging the cassette-holding surfaces of a transport, a pair of precision ball bearing assemblies mounted solidly on the baseplate, and a pair of tape pack hubs mounted on the bearings and adapted to loosely engage the driving spindles of the transport, so that misalignment of the transport spindles can be tolerated while maintaining the tape packs precisely spaced from the walls of the cassette to avoid rubbing flutter and the abrasion production of oxide dust. The tape is guided with substantial lateral tolerance near the transducing and metering elements of the transport, but is precisely edge-guided near the tape packs. The guides are placed to increase the run of tape available for access.

3,625,456

TEMPERATURE-COMPENSATED TAPE RECORDER DRIVE DIFFERENTIAL

Frederick E. Hankins, Flemington, N.J., assignor to Lockheed Aircraft Corporation, Burbank, Calif.

Filed June 12, 1970, Ser. No. 45,768
Int. Cl. G03b *1/04*
U.S. Cl. 242—192 **10 Claims**

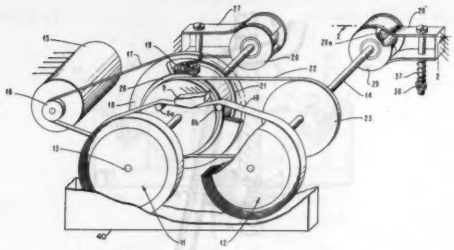


The capstans or the driving pulleys of a magnetic tape recorder are made of different materials having different coefficients of thermal expansion, so that their effective diameters will change at different rates with temperature changes, in a direction to increase the speed differential with increasing temperature at a rate sufficient to compensate for the decrease in tensile modulus of the polyester tape backing. The effect achieved is a reduction of the peripheral speed of the slow capstan of a tape recorder with respect to the peripheral speed of the fast capstan with increasing temperatures.

3,625,457
REEL-FEED TAPE DRIVE WITH VELOCITY COMPENSATION

James A. Weidenhammer, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,066
Int. Cl. B11b *15/32*; G03b *1/04*
U.S. Cl. 242—201 3 Claims

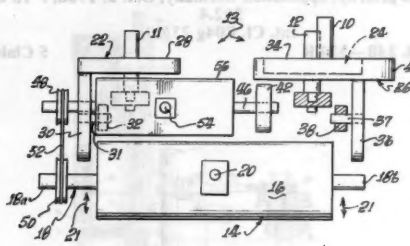


A capstanless, reel-driven tape drive with little tape speed or recorded density variation. A differential mechanism has its carrier connected to a drive motor and its outputs connected respectively to the two reel spindles to obtain a solely reel-driven tape. A feedback for velocity control is obtained via the tensioned tape.

3,625,458
DRIVE MECHANISM FOR SOUND RECORDING AND PLAYBACK DEVICES

Peter Karl-Heinz Fischer; Rudolph Herrmann Mesecke, and Hans-Joachim Schoening, all of Monterey Park, Calif., assignors to S. James Wild; Michael B. Montgomery, Los Angeles; Peter Karl-Heinz Fischer, Monterey Park; Hans-Joachim Schoening, Monterey Park and Harold B. Guyer, Los Angeles, Calif.

Filed July 24, 1969, Ser. No. 844,573
Int. Cl. G11b *15/28*, *15/30*
U.S. Cl. 242—201 5 Claims

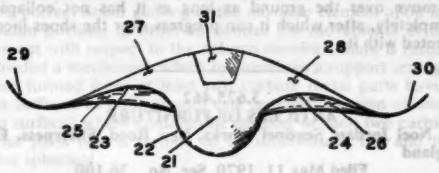


A compact drive mechanism for a tape recorder enabling the recorder to rapidly drive tape in a forward or a reverse direction or at a slower record and playback speed. The drive mechanism includes a motor having a double-ended drive shaft. A pair of friction clutch means is connected to forward and reverse tape-driving spindles of the recorder for selective coupling to opposite ends of the drive shaft to effect the rapid forward and reverse tape drive. A transmission means connects between one end of the drive shaft and the capstan of the recorder to turn the capstan at the record and playback speed. This occurs when the friction clutch couples the forward tape-driving spindle to the drive shaft. Thus, when the pinch roller of the recorder is engaged, the capstan drive overrides the clutch means of the forward tape-driving spindle causing it to slip and tape to be driven from a reel on the reverse tape-driving spindle to a reel on the forward tape-driving spindle at the playback and recording speed.

3,625,459
AIRFOIL DESIGN

Walter C. Brown, Box 278, Yeoho Road, Sparks, Md.

Filed May 18, 1970, Ser. No. 38,006
Int. Cl. B64c *3/02*
U.S. Cl. 244—35 4 Claims

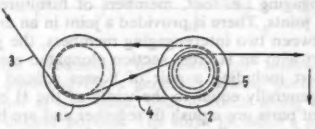


A new delta-wing aircraft wherein airflow effectively alters geometry with airspeed to produce high lift at low speed and low-induced drag at high speed.

3,625,460
ARRESTING DEVICE FOR AIRCRAFT

Per Borje Fonden, Hejdegatan 3, and Karl Ove Torgny Walander, Elsa Brandstrom gata 5, both of Linkoping, Sweden

Filed Jan. 19, 1970, Ser. No. 3,767
Claims priority, application Sweden, Feb. 12, 1969, 1895/69
Int. Cl. B64f *1/02*
U.S. Cl. 244—110 C 4 Claims

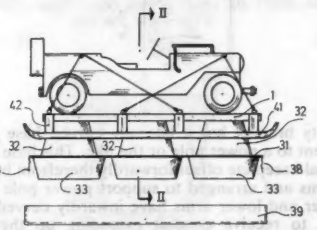


An arresting device for aircraft and which includes a band or cable connected to an arrestor, and which band or cable is stored in a magazine and is drawn therefrom during the arresting operation. The band engages a bollard that consists of at least two rotatable wheels or pulleys, at least one of the wheels or pulleys being coupled to a brake, the band pursuing a certain course in respect to the wheels or pulleys whereby during the arresting operation the band or cable is always drawn from an inner turn on one of the wheels, with the band leaving from that portion of said wheel which faces toward another of the wheels.

3,625,461
LOAD-LANDING DEVICE

Paul Francois Gulenne, Paris, and Paul Aime Lebargy, Les Clayes-sous-Bois, both of France, assignors to BERTIN & Cie, Plaisir, France

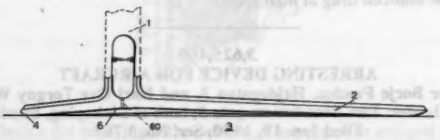
Filed Oct. 21, 1969, Ser. No. 868,018
Claims priority, application France, Oct. 23, 1968, 171003
Int. Cl. B64d *1/08*
U.S. Cl. 244—138 R 7 Claims



A load-landing device wherein a load-carrying plate dropped from an aircraft carries underneath its lower surface

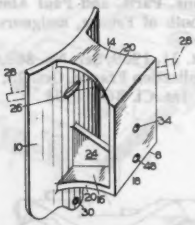
substantially frustoconical inflatable bags which are carried in their turn by an intermediate plate provided with perforations through which the bags communicate with the inside of skirts depending from the intermediate plate. Thus when the device is dropped, the volume confined within the skirts is fed with air out of the bags so that the cushions formed within said confined volumes sustain the device and allow it to move over the ground as long as it has not collapsed completely, after which it can progress over the shoes incorporated with it.

3,625,462
ARTICLES OF FURNITURE
W. Noel Jordan, Sentinel Works, New Road, Sheerness, England
Filed May 11, 1970, Ser. No. 36,100
Claims priority, application Great Britain, May 29, 1969, May 29, 1969, June 25, 1969; 27,141/69, 27,142/69, 32,159/69
Int. Cl. A47b *13/06*
U.S. Cl. 248—188.8 **3 Claims**



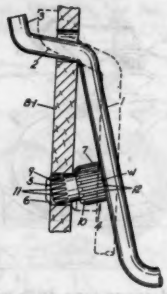
The present invention relates to furniture joints and ground-engaging i.e. foot, members of furniture associated with such joints. There is provided a joint in an article of furniture between two interengaging members, the joint having a first part with an H cross section elongated element and a second part including a pair of bosses spaced apart by a distance generally equal to the width of the H central web. These joint parts are a push fit together and are bonded by a heat-treated resin adhesive. A ground-engaging member associated with one part of the joint is so curved that in an unloaded state only the end regions of the curve engage the ground whereas in a loaded state not only the end regions but also at least some intermediate regions engage the ground. There is also provided an improved method of making a part of the joint disclosed.

3,625,463
UTILITY BRACKET FOR POWER POLES AND THE LIKE
Julian W. Scholz, 6001 S.E. Laurel St., Portland, Oreg.
Filed Feb. 19, 1970, Ser. No. 12,636
Int. Cl. H01b *17/16*
U.S. Cl. 248—221 **2 Claims**



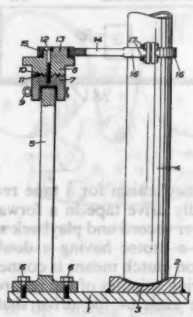
A utility bracket has a laterally curved base portion for securement to a power pole or the like. This base portion has an integral baseplate offset forwardly therefrom by upper and lower arms and arranged to support power pole equipment. The upper and lower arms have inwardly curved side edges arranged to receive conduit extending up the pole. The bracket is attached to the pole by suitable bolt means extending through the baseplate or if desired through both the baseplate and the support face as well as through equipment supported thereon.

3,625,464
ARTICLE SUPPORT FOR APERTURED PANEL
Harold J. Conran, Ravenna, Mich., assignor to Leigh Products, Inc., Coopersville, Mich.
Filed July 10, 1970, Ser. No. 53,739
Int. Cl. A47f *5/00*
U.S. Cl. 248—223 **8 Claims**



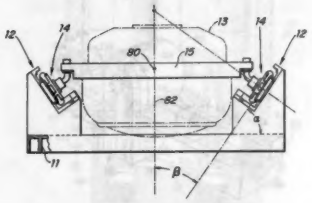
A vertical wire has an inclined bend at its upper end with an upwardly extending tip to extend through and engage behind the holes in apertured panels of different thicknesses. A supporting stud is welded to a lower portion of the wire to engage in a lower hole in the board. The stud is stepped to provide a smaller rear portion engageable in smaller holes and a larger portion to fit in larger holes. The peripheries of both portions of the stud are axially serrated and their rear edges are tapered to bite into the edges of holes that vary from nominal sizes and facilitate penetration of the stud into the holes.

3,625,465
MINE ROOF SUPPORTS
Hans-Wilm Heimburg, Recklinghausen, Germany, assignor to Gullick Limited, Lancashire, England
Filed Apr. 28, 1969, Ser. No. 819,781
Claims priority, application Germany, Oct. 2, 1968, P 18 00 562.4
Int. Cl. E04g *25/00*
U.S. Cl. 248—354 R **5 Claims**



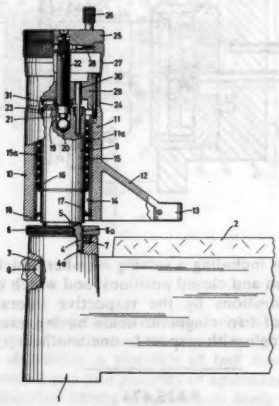
A mine roof support has a leg alignment device in the form of a resilient steady which extends from a baseplate and is connected at its upper end with the leg through a variable length device. The variable length device is an eccentric in the form of a pin on a plate rotatable and lockable on the top of the steady. The pin is connected by a connecting rod to the leg.

3,625,466
VIBRATION ISOLATOR
Philip Marshall, Lexington, and Joseph C. Boeggeman, Beverly, both of Mass., assignors to Marshall Research & Development Corp., Burlington, Mass.
Filed Aug. 20, 1970, Ser. No. 65,592
Int. Cl. F16f 15/04
U.S. Cl. 248—358 R 12 Claims



A vibration isolator suspension element for use in a vibration isolating system. The suspension element comprises first and second sets of parallel, spaced-apart U-springs which longitudinally extend at right angles and in parallel planes to one another. Means are provided for connecting the sets of U-springs in series relation as well as means for mounting the element to both a supporting structure and to a mass to be supported. The element is also provided with integral means for providing friction damping during both translational and rotational motion to which the mass may be subjected.

3,625,467
MOVABLE SUPPORT DEVICE FOR AT LEAST ONE INSTRUMENT SERVING TO MEASURE THE DIMENSIONS OF AN OBJECT
Willy Schaerer, Terrassenweg 18, Bern, Switzerland
Filed Feb. 6, 1970, Ser. No. 9,269
Claims priority, application Switzerland, Feb. 17, 1969, 2342/69
Int. Cl. G01b 3/22
U.S. Cl. 248—405 11 Claims

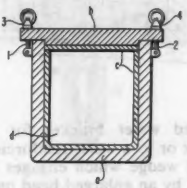


There is disclosed a movable support device for at least one instrument serving to measure the dimensions of an object, which support device is of the type incorporating a base which carries an orientation or aligning plate and at which there is supported a movable column member. A freely disposed portion of this column member is cylindrical and carries a movable element which is provided with means for positioning at least a given measuring instrument with respect to the orientation plate. Furthermore, this element possesses a bore and by means of a sliding bearing equipped with a cage and prebiased balls is linearly guided at the freely disposed cylindrical portion of the column member. According to an important aspect of the invention, a bushing or sleeve member is inserted in the bore of the movable element and adhesively secured and, further, possesses a perfectly smooth and cylindrical inner surface. This inner surface cooperates with the balls of the sliding bearing and the freely disposed portion of the column member, in order to insure for a perfect linear guiding of the movable element upon this column portion. In order to control the movements of this element with respect to the column member, there is further provided a mechanism which incorporates a support arrangement formed from at least two carbide metal parts having two surfaces in contact with one another, wherein of these two surfaces which contact one another of such two carbide metal parts one is formed to be substantially flat and the other spherical.

3,625,468
PANEL FORM WITH REMOVABLE OVERHANG ABOVE WELL PORTION
Gordon L. Marcott, 1365 Columbine St., Denver, Colo.
Filed Aug. 7, 1969, Ser. No. 848,167
Int. Cl. B28b 7/06
U.S. Cl. 249—98 6 Claims

A form for producing, by casting or molding as in concrete, a panel having a generally planar portion and a thicker portion at one edge, with a notch along the outer edge of the thicker portion. The form includes a plate conforming to one side and the edges of the panel, thus providing a well to form the thicker portion, with an adjustable overhang corresponding in contour to the notch. Reinforcement is readily placed in the mold, through the open space of the mold top. Lips extend outwardly from the opposite sidewalls of the plate to provide, respectively, striking surfaces with the upper edge of the overhang and a mounting position for the overhang. Flexing devices, which are connected between the base for the plate and the sidewalls, are mounted in a protected position beneath the lips, while the connections between the base and the underside of the plate, as by welding, are at positions spaced from the outer edges of the plate. The overhang is removable, as well as end plates which close the molding space. The end plates are removed and the overhang may be loosened before the edges of the plate are flexed to permit lifting of the cast panel from the mold, as after the concrete has initially set.

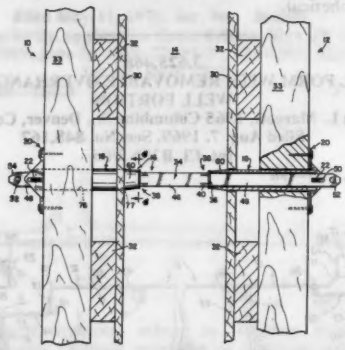
3,625,469
APPARATUS FOR MOLDING SYNTHETIC RESINS
Haruo Nitta, and Naotoshi Sagawa, both of Yokkaichi-shi, Mie, Japan, assignors to Mitsubishi Petrochemical Co., Ltd., Chiyoda-ku, Tokyo, Japan
Filed Aug. 21, 1969, Ser. No. 851,914
Claims priority, application Japan, Aug. 21, 1968, 43/59395
Int. Cl. B29c 1/04
U.S. Cl. 249—115 3 Claims



Molding a synthetic resin in a metallic mold provided with glassy layer, such as a porcelain enamel layer, on its molding

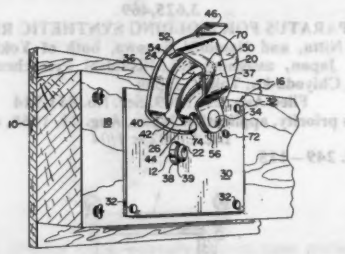
surface. The molded article is excellent in gloss and easily removed from the mold. The glassy layer is heat resistant and durable in adherence to the mold.

3,625,470
TIE ROD SECURING MEANS FOR A CONCRETE WALL FORM
James C. Shoemaker, Hampshire, Ill., assignor to Symons Mfg. Company, Des Plaines, Ill.
Filed Feb. 25, 1969, Ser. No. 802,109
Int. Cl. E04g *17/10*
U.S. Cl. 249—214 **5 Claims**



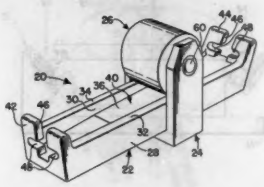
Securing means for a concrete wall form including a flat tie rod having means at its end sections for attachment to the form sides so that the medial section of the tie rod spans the form and becomes embedded in the concrete which is poured between the form sides, thus leaving outwardly projecting tie rod end sections. Elongated sleeve cones surround such tie rod end sections and have their inner ends drivingly connected to the same at regions in the immediate vicinity of the tie rod breakbacks, and also have torque-application facilities at their exposed outer ends so that the manual application of torque to the sleeve cones will impart a radial tear or shear effect at the breakbacks to thus free the projecting tie rod end sections.

3,625,471
WALER BRACKET FOR A CONCRETE WALL FORM
George J. Eriksson, Morton Grove, Ill., assignor to Superior Concrete Accessories, Inc., Franklin Park, Ill.
Filed May 9, 1969, Ser. No. 823,308
Int. Cl. E04g *19/04*
U.S. Cl. 249—219 **3 Claims**



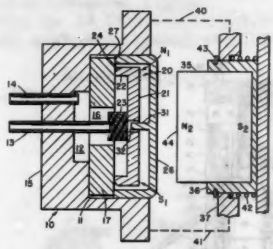
A self-contained waler bracket for attachment either directly to a waler or to a waler-reinforcing stud and including a helical split wedge which engages an inwardly facing shoulder afforded by an enlarged head on a tie rod for placing the tie rod under tension, and further including a wedge-spanning hoodlike strap which engages an outwardly facing reaction shoulder on the head to prevent inward movement of the bracket and consequently of the waler and the side of the concrete wall form that is served thereby.

3,625,472
ROLLER CLAMP FOR FLEXIBLE TUBING
Frank J. Rychlik, Northbrook, Ill., assignor to Illinois Tool Works, Inc., Chicago, Ill.
Filed Sept. 19, 1969, Ser. No. 859,374
Int. Cl. F16k *7/06*
U.S. Cl. 251—6 **12 Claims**



A variable clamp device for controlling fluid flow through resilient tubing. The clamp includes a body having a reference surface, a rigid roller maintained by resilient pressure in intimate contact against the reference surface and a channel having a varying depth relative to the axial extent of the reference surface for accepting the tubing with the roller acting on the tubing as the roller moves along the reference surface to compress the tubing within the channel.

3,625,473
PERMANENT MAGNET VALVE WITH MAGNETIC OPERATOR
Vladimir Ignatjev, Norwalk, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.
Filed Apr. 16, 1969, Ser. No. 816,563
Int. Cl. F16k *31/08*
U.S. Cl. 251—65 **3 Claims**

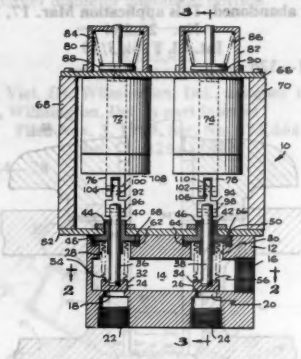


Valving means including a valving member which is movable between open and closed positions, and which is actuated between said positions by the respective interaction and noninteraction of two magnetic fields having axes that are disposed at an angle with respect to one another.

3,625,474
SOLENOID-ACTUATED HIGH-TEMPERATURE FLUID VALVES
Julius R. Juede, 5526 Cleon Ave., Los Angeles, Calif.
Filed Nov. 21, 1969, Ser. No. 878,658
Int. Cl. F16k *31/06*
U.S. Cl. 251—77 **4 Claims**

High-temperature valves are difficult to seal, and careful sealing is necessary, particularly where the fluid being valved is inflammable or, for other reasons, leakage must be minimized or eliminated. In several species disclosed herein, leakage is minimized by a properly prepared and surface-treated valve stem, for maximum smoothness and minimum wear, together with seals of organic material having the

requisite temperature resistance bearing thereagainst. In the preferred species, a bellows is secured between the valve body and the valve disc, with the valve stem limited to axial



movement so complete sealing is effected. In a special case, the bellows is a synthetic polymer composition material with the bellows formed unitarily, on one end, with the synthetic polymer composition valve disc.

3,625,475

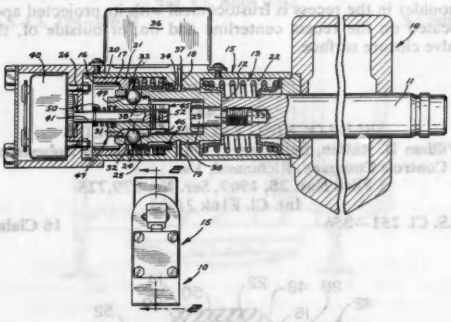
VALVE DETENT APPARATUS

William T. Stephens, and Ralph R. Ohnesorge, both of c/o Gresen Manufacturing Co., P.O. Box 1313, Minneapolis, Minn.

Continuation-in-part of application Ser. No. 885,078, Dec. 15, 1969, now abandoned. This application May 11, 1970, Ser. No. 36,226

Int. Cl. F16k *35/02*

U.S. Cl. 251—111 **22 Claims**



An improved detent mechanism for a hydraulic valve of the spool type. An extension of a valve spool includes a cage for axially displacing a plurality of ball members that are radially movable in a like plurality of apertures in the cage. A detenting member having a cylindrical body portion at one end and an enlarged, axially grooved cylindrical portion having an inclined ramp facing the cylindrically shaped portion and the valve spool is rotatably and reciprocably mounted with respect to the valve body. The detenting member is biased toward the valve spool and an inclined shoulder facing axially outwardly of the valve spool is provided radially outwardly of the normal position of the enlarged end of the detenting member. As the spool is moved toward the detenting member, the apertures are in radial registration with the enlarged cylindrical end portion of the detenting member. Engagement of the ball members with the ramp portions moves the detenting member axially to allow the ball members to move radially outwardly into detenting engagement with the shoulder. The detenting engagement is released upon rotation of the detenting member so that the ball members may fall into the grooves in the enlarged end of the detenting member and allow the spool member to return to its normal axial position.

3,625,476

VALVING ARRANGEMENT

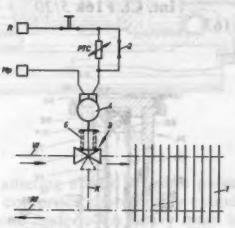
Hans Meier, Remscheid, Germany, assignor to Joh. Vaillant KG., Remscheid, Germany

Filed Oct. 22, 1969, Ser. No. 868,411

Claims priority, application Germany, Dec. 23, 1968, P 18 16 558.7

Int. Cl. F26k *31/02*

U.S. Cl. 251—129 **1 Claim**



A valve operator includes an electric motor moving the valve in one direction and working against a spring which moves the valve in the other direction. The energizing circuit for the motor includes an on-off switch and a temperature-dependent semiconductor. The semiconductor is connected to provide graduated energization of the motor during one of the valve movements. In one embodiment the semiconductor is in parallel with the switch and has a positive temperature coefficient. In another embodiment the semiconductor is in series with the switch and has a negative temperature coefficient. In the latter embodiment a second switch is in parallel with the semiconductor and this switch is normally open, but is closed after the motor is energized and upon its moving the valve to the fully open position.

3,625,477

MAGNETIC VALVE WITH GROOVED ARMATURE SURROUNDED BY DISCRETE DISC-SHAPED ANNULAR WINDINGS

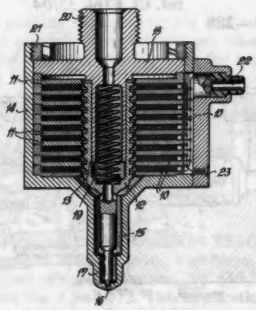
Wilhelm Vogel, Stuttgart-Bad Cannstatt, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed Apr. 7, 1970, Ser. No. 31,046

Claims priority, application Germany, Apr. 18, 1969, P 19 19 708.1

Int. Cl. F16k *31/06*

U.S. Cl. 251—137 **5 Claims**



A magnetic valve has a housing provided with an aperture and a valve member movable in the housing between two

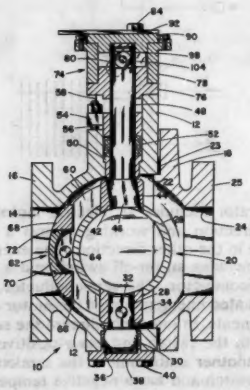
positions in which it respectively opens and blocks the aperture. An armature of ferromagnetic material is connected to the valve member for movement with the same and provided with a predetermined number of axially successive outer circumferential grooves. Winding means cooperates with the armature for moving the same when energized and has a number of discrete disc-shaped annular windings surrounding the armature, this number corresponding to the predetermined number of grooves in the armature. Each of these windings constitutes a discrete electromagnet whose magnetic field acts upon the armature.

3,625,478

DUAL-ACTION BALL VALVE

Henry R. Killian, Greensburg, Pa., assignor to Walworth Company, New York, N.Y.

Filed Oct. 7, 1969, Ser. No. 864,422
Int. Cl. F16k *5/20*
U.S. Cl. 251—163 **2 Claims**



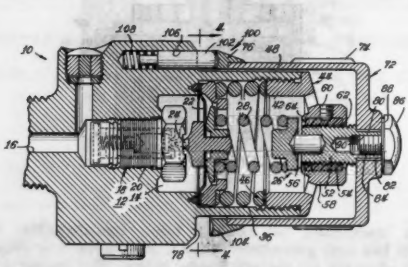
A rotatable valve structure, such as a ball or plug valve, wherein the plug working surface may be tilted into sealing engagement with the seat. A camming surface on the upper shaft of the rotary member slidably engages a complementary surface on the rotary member to produce transverse movement of the rotary valve member in response to axial movement of the shaft. Hence, the valve closure surface may be turned to a face-to-face position relative to the seat and then, in response to axial movement of the camming shaft, it is tilted and pressed into firm seating engagement.

3,625,479

TOUCH CONTROL REGULATOR

George L. Hammon, Oakland, Calif., assignor to Chemetron Corporation, Chicago, Ill.

Filed Jan. 9, 1971; Ser. No. 1,729
Int. Cl. F16k *35/04*
U.S. Cl. 251—288 **21 Claims**



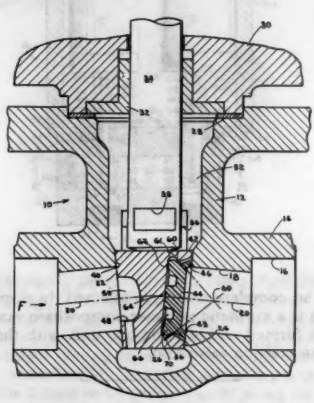
A gas pressure regulator has a touch-responsive knob or cap permitting reasonably accurate intermediate adjustment of the flow rate without reference to calibrated markings.

3,625,480

TEMPERATURE COMPENSATED PRELOADED SEAL

Pieter F. Hoos, Greensburg, Pa., assignor to Aloyco Incorporated, Linden, N.J.

Continuation-in-part of application Ser. No. 758,462, Sept. 9, 1968, now abandoned. This application Mar. 17, 1970, Ser. No. 20,234
Int. Cl. F16k *3/30*
U.S. Cl. 251—326 **7 Claims**



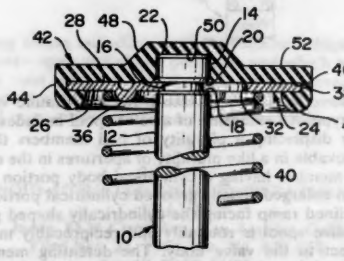
A valve seal assembly wherein a circular recess in the valve closure member accommodates a normally resilient circular seal member with a relatively narrow annular ridge around the outside of the front face to seal against the opposing working surface. Because of a central axial protuberance, the back of the seal engages the bottom of the recess only at the central portion in absence of distortion. However, an internal shoulder in the recess engages a radial shoulder around the seal member to rotate the sealing ridge about the protuberance toward the back of the seal recess so as to preload the seal in the nature of a Belleville spring washer. The internal shoulder in the recess is frustoconical with its projected apex located on the recess centerline and on, or outside of, the valve closure surface.

3,625,481

SELF-LOCKING VALVE ASSEMBLIES

William D. Rattan, Bellflower, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

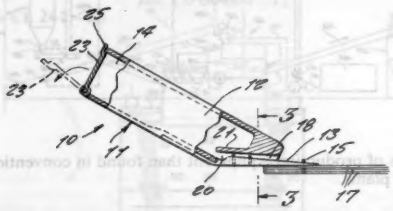
Filed Nov. 25, 1969, Ser. No. 879,725
Int. Cl. F16k *21/00*
U.S. Cl. 251—356 **16 Claims**



Self-locking valve assemblies including a resilient valve facing having a peripheral edge gripping the outer rim of a backup plate and a central portion engaging the head of a valve stem, the backup plate having a keyhole slot therein for receiving the head of the valve stem and permitting the valve stem to be centrally disposed with respect to the backup plate when a neck of the valve stem is aligned with the

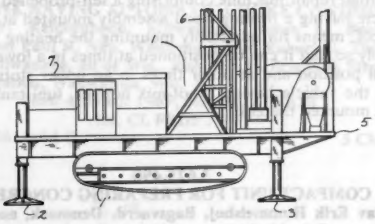
backup plate. Various embodiments include backup plates having arcuate and radial strengthening ribs, L-shaped keyhole slots and keyhole slots having a link with a small width and a valve stem having a small diameter sliding portion and a larger diameter alignment portion.

3,625,482
STAPLE REMOVER
Charles F. Viel, III, Wilmington, Del., assignor to Samuel V. Abramo, Wilmington, Del., a part interest
Filed Nov. 3, 1969, Ser. No. 873,444
Int. Cl. B25c *11/00*
U.S. Cl. 254—28 **5 Claims**



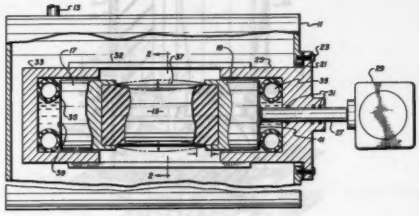
A device for removing the staples from papers stapled together, and the device including a staple storage chamber within which the used staples may be retained so to prevent the same from scattering about, and the storage chamber having a pivotally openable door so as to empty the used staples into a refuse receptacle.

3,625,483
AUTOMATIC LEVELING SYSTEM FOR BLAST HOLE DRILLS AND THE LIKE
Thomas A. Stoner, Brookfield, Wis., assignor to Bucyrus-Erie Company, South Milwaukee, Wis.
Filed Feb. 24, 1970, Ser. No. 13,689
Int. Cl. B60s *9/02*
U.S. Cl. 254—86 H **5 Claims**



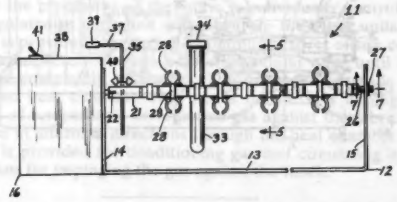
An automatic system for leveling a blast hole drill during raising and lowering includes a front jack on the longitudinal axis of the machine and a pair of rear jacks which straddle the longitudinal axis and define a transverse axis. An operating fluid line for the jacks is connected to a first proportioning valve which is controlled by a first level sensor operative along the longitudinal axis. The proportioning valve apportions flow between the front jack and the two rear jacks and alters the flow ratio as necessary to keep the machine level on the longitudinal axis. A second proportioning valve controlled by a second level sensor operative along the transverse axis is interposed in that output of the first valve which leads toward the two rear jacks. It apportions the flow between the two rear jacks to level the machine along the transverse axis. This sequential apportioning of fluid flow is used to level the machine and keep it level as it is raised and lowered to and from a working position in which it is supported by the jacks.

3,625,484
MONOPOLE ELASTOMERIC RESONATOR
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Continuation-in-part of application Ser. No. 666,398, Sept. 8, 1967, now Patent No. 3,544,073. This application June 16, 1969, Ser. No. 833,293
Int. Cl. B06b *1/16, 1/20*
U.S. Cl. 259—1 **7 Claims**



A device for radiating elastic pressure pulses into a liquid container which comprises a preferably cylindrically shaped body of elastomeric material. A heavy mass is connected to each end of the cylinder of elastomeric material, each mass being further surrounded with a cylinder such that the mass acts as an isolated piston therein, with one mass being coupled to an orbiting mass oscillator.

3,625,485
TEST TUBE ROCKER AND ROTATOR
Stanford L. Adler, Monsey, N.Y., assignor to Justin J. Shapiro, Berkeley, Calif.
Filed Sept. 25, 1970, Ser. No. 75,613
Int. Cl. B01f *11/00*
U.S. Cl. 259—56 **10 Claims**

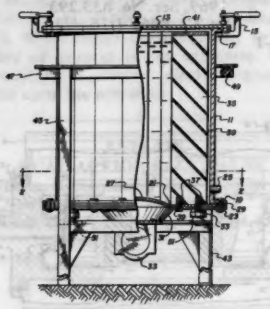


A rotating or rocking rack device for test tubes or vials. The rack device consists of a support on which a shaft is rotatably mounted, the shaft having clips for supporting test tubes or vials. A bidirectional motor is mounted on the support and is connected directly to the shaft. The shaft has an arm which can be adjusted to engage the housing of the motor, causing the motor to oscillate the shaft, or it can be adjusted to clear the housing, whereby the motor will rotate the shaft continuously in one direction.

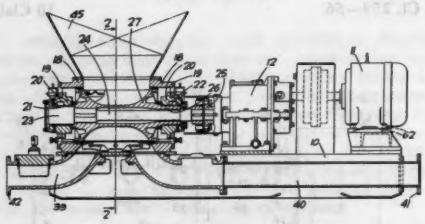
3,625,486
MULTIPLE-PILLAR ELASTOMERIC RESONATOR
Albert G. Bodine, 7877 Woodley Ave., Van Nuys, Calif.
Continuation-in-part of application Ser. No. 666,398, Sept. 8, 1967, now Patent No. 3,544,073. This application June 16, 1969, Ser. No. 833,294
Int. Cl. B06b *1/16, 1/20*
U.S. Cl. 259—72 **9 Claims**

A device for radiating elastic pressure pulses into a liquid container which comprises a tank for containing a liquid

therein having an orbiting mass oscillator coupled outside the bottom surface of the tank and a plurality of elastomeric pillar elements affixed to the bottom surface of the tank extending within the tank about its circumference.



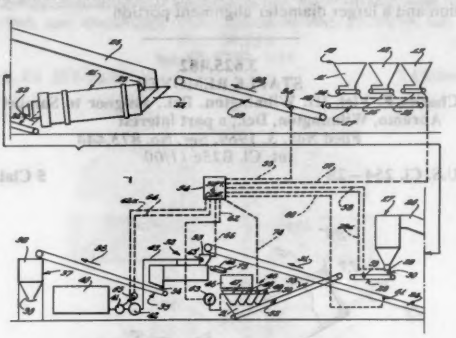
3,625,487
PLACING OF CONCRETE
Harry Spragg, Chesterfield, England, assignor to Markham & Company Limited, Chesterfield, England
Filed Oct. 16, 1969, Ser. No. 866,860
Claims priority, application Great Britain, Nov. 13, 1968, 53,795/68
Int. Cl. B28c *7/04*
U.S. Cl. 259—153 **4 Claims**



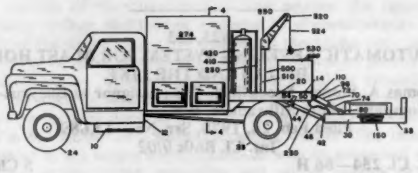
Apparatus for placing concrete comprises a duct to guide the concrete from a mixing station to a placing station, a pump to provide a continuous flow of air in the duct in the direction towards the placing station, a rotor at the mixing station to feed a dry concrete mix into the duct at a predetermined rate, and a ring of nozzles around the duct adjacent the placing station to inject water into the duct at a predetermined rate, the rates being set to provide a predetermined wet concrete mix.

3,625,488
PROPORTIONING CONTROL SYSTEM FOR AN ASPHALT PLANT
Robert E. Farnham, Naperville; Fredric W. Prill, Aurora; Donald W. Smith, Aurora, and James J. Plociennik, North Aurora, all of Ill., assignors to Barber-Greene Company, Aurora, Ill.
Filed Sept. 8, 1969, Ser. No. 856,007
Int. Cl. B01f *15/04*; **G05d** *11/02*
U.S. Cl. 259—154 **11 Claims**

An asphalt plant employs a supervisory control system including weighing apparatus at different plant stations for signalling weights of flowing material in the plant for controlling the amount of material and bitumen flow. Continuous supervision and control of asphalt production enables optimum operation of an asphalt plant utilizing fewer components of production equipment than found in conventional asphalt plants.

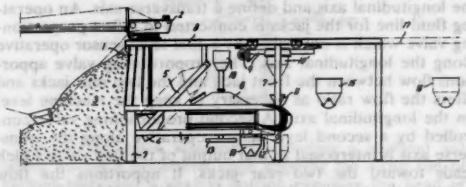


3,625,489
ROAD REPAIR MACHINE
Arthur James Weaver, Omaha, Nebr., assignor to Infra-Radiant Corporation, Peoria, Ill.
Filed Aug. 7, 1970, Ser. No. 62,074
Int. Cl. B28c *1/22*
U.S. Cl. 259—157 **7 Claims**



A road repair machine comprising a self-propelled wheeled vehicle having a heating hood assembly mounted at one end thereof, means for adjustably mounting the heating hood assembly so that it can be positioned at times in a lower operational position and at other times in an upper storage position, the vehicle having a hot-mix hopper, fuel tanks and a hoist mounted thereon.

3,625,490
COMPACT UNIT FOR PREPARING CONCRETE
Gustav Erik Hummelshoj, Bagsvaerd, Denmark, assignor to Thomas Schmidt, Bagsvaerd, Denmark, a part interest
Filed Nov. 3, 1969, Ser. No. 873,434
Claims priority, application Denmark, Nov. 5, 1968, 5362/68
Int. Cl. B28c *7/16*
U.S. Cl. 259—169 **3 Claims**



A compact concrete preparing unit having a frame which carries, besides a mixer and usual equipment for supplying cement, aggregates etc. to said mixer, an overhead runway

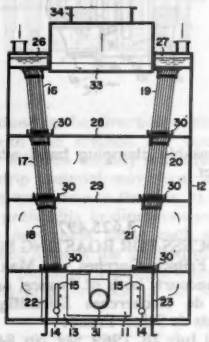
rail for a travelling hoisting winch with a concrete bucket to receive a charge of concrete from said mixer for transporting to a casting site adjacent a rail system, to which the runway rail of the compact unit may be connected after having been vertically adjusted to the level of said rail system.

3,625,491

CLEANING APPARATUS FOR CONTAMINATED GASSES

Masao Yokoi, Tokyo; Kiyoshi Uyama; Kenji Indo; Yoshiyuki Nakai, and Tetsuya Yokogawa, Yokohama-shi, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Chiyoda-ku, Tokyo, Japan

Filed Feb. 24, 1969, Ser. No. 801,665
Claims priority, application Japan, Mar. 1, 1968, Mar. 1, 1968; 43/15470, 43/15471
Int. Cl. B01d *47/12*
U.S. Cl. 261—23 **2 Claims**



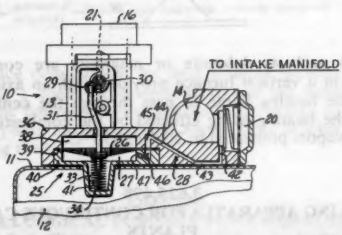
Gas-cleaning apparatus comprises a gas inlet port, a demister, a discharger port, and at least one liquid film-forming screen and liquid spray means disposed between the inlet port and screen, whereby gas passes through the liquid film-forming screen.

3,625,492

CARBURETOR FOR SMALL INTERNAL COMBUSTION ENGINE HAVING AUTOMATIC CHOKE CONTROL

Joseph V. Reichenbach, Milwaukee; James L. Bartlett, Mequon; Paul R. Nau, Wauwatosa, and Robert G. Thompson, Milwaukee, all of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Apr. 16, 1969, Ser. No. 816,628
Int. Cl. F02m *1/14*
U.S. Cl. 261—64 C **3 Claims**



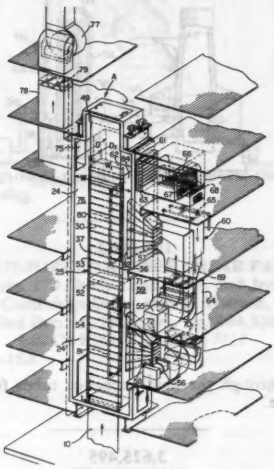
An automatic diaphragm-type control for the choke valve of a carburetor for small single cylinder engines by which the choke valve is continually and automatically adjusted solely by engine suction opposing a spring force, to provide the optimum air-fuel ratio for combustible mixture drawn into the engine, not only during starting but at all operating conditions.

3,625,493

MODULAR HEATING UNIT FOR PROCESSING TIRE CORD FABRIC

Edward E. Hunter, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 20, 1970, Ser. No. 12,978
Int. Cl. F27b *9/28*
U.S. Cl. 263—3 **30 Claims**



A large composite oven formed from a number of smaller individual modular heating units or ovens, which are disposed in side-by-side relation. The temperature of gas used in the processing of the fabric is individually controlled and regulated in each unit separate from the other units. A system is provided for moving a continuous sheet of tire cord fabric successively through adjacent modular units until the fabric is completely processed. The units each include an elongated heat chamber with means for forcibly impinging streams of temperature conditioned gas against the fabric as it moves in alternate directions through the heat chamber. A system is provided for conditioning gas and circulating it to the means for impinging the gas against the fabric.

3,625,494

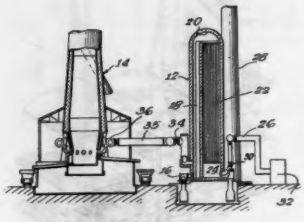
BLAST FURNACE STOVE

John E. Allen, 606 Timber Lane, Lake Forest, Ill.

Filed Feb. 24, 1970, Ser. No. 13,329
Int. Cl. F23l *15/02*
U.S. Cl. 263—19 **20 Claims**

A blast furnace stove or like air heater is provided in which the main stove wall, i.e., the ring wall, is an integral wall of poured refractory concrete having varying refractory properties to provide a varying degree of heat resistance increasing from the bottom to the top of the wall. The dome portion of the stove can conveniently be constructed of firebrick so that the stove shell or wall provides proper heat resistance in accordance with the temperature to which the various zones of the stove, and the checkers contained therein, are subjected. An inner liner of joined steel plates are used as a form for pouring the refractory concrete during construction of the refractory wall and plates can be retained in place if desired. An alloy steel structure supports the checker network within the stove and, as desired, heat exchange tubing or the like is provided in close proximity to the steel structure for cooling the structure below a temperature at which failure in the steel may occur. The heat exchange tubing is covered by a steel shield which provides a dead air space for further protection of the support structure. Heat exchange tubes are

also embedded in the masonry work covering a steel bottom plate of the stove and heat exchange fluid such as water is

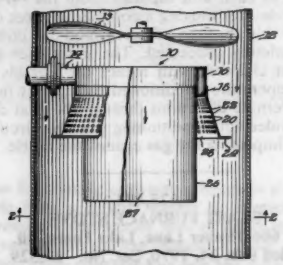


circulated through the heat exchange tubes for cooling the bottom plate.

3,625,495
GAS BURNER

Guy R. Harter, New Castle, and Harry R. Maxon, Jr., Muncie, both of Ind., assignors to Maxon Premix Burner Company, Inc., Muncie, Ind.

Filed Mar. 9, 1970, Ser. No. 17,775
Int. Cl. F23l 9/04
U.S. Cl. 263—19 A **3 Claims**



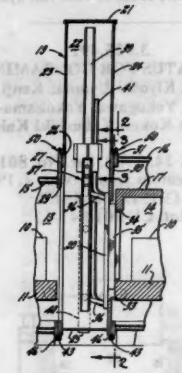
A gas burner for heating a stream of moving air in a duct. The burner body comprises a continuous peripheral combustion mixing chamber extending into the path of relatively high-speed air which is generated in the duct off the tips and the outer portions of the blades of a propeller-type fan forcing air through the duct. An air control sleeve comprises the central portion of the burner body in the path of relatively lower velocity air in the moving stream which is generated by the central portions of the blades.

3,625,496
SEALING ASSEMBLY FOR HEAT-TREATING APPARATUS

June Richard Bornor, Rockford, Ill., assignor to Alco Standard Corporation, Valley Forge, Pa.

Filed Nov. 3, 1969, Ser. No. 873,191
Int. Cl. F27b 3/02; F26b 25/00
U.S. Cl. 263—40 R **4 Claims**

A gastight seal is established between a vessel and a closure unit of a heat-treating apparatus by an elongated flexible gasket which simply may be wrapped around the outer peripheries of the vessel and the closure unit and anchored in

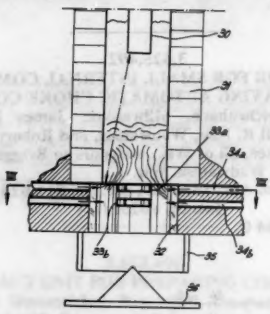


place by a releasable clamping band adapted to contract around the gasket.

3,625,497
PROCESS FOR ROASTING SOLIDS

Andre Alphonse Fritsch, Garches, and Max Hermant Hicguet, Boulogne-Billancourt, both of France, assignors to Societe D'Etudes Et de Recherches Scientifiques Et Minieres, Malakoff, Hauts de Seine, France

Filed July 28, 1969, Ser. No. 845,260
Claims priority, application France, July 30, 1968, July 10, 1969; 161153, 6923514
Int. Cl. F27b 1/10
U.S. Cl. 263—52 **9 Claims**



Solids such as dolomite or magnesia are continuously roasted in a vertical furnace provided with an axial tube to cause the heating flame to pass through the center of the solids, the heating being effected by the combustion of dry fuel oil vapors preheated to 300° to 650° C.

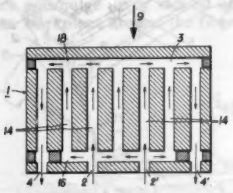
3,625,498
COOLING APPARATUS FOR CONTINUOUS CASTING PLANTS

Alfred Adamec, and Roland Leder, both of Vienna, Austria, assignors to Wiener Schwachstremwerke GmbH, Vienna, Austria

Filed Oct. 8, 1969, Ser. No. 864,829
Claims priority, application Austria, Nov. 15, 1968, A 11127/68
Int. Cl. C21d 9/56
U.S. Cl. 266—3 **9 Claims**

A continuous casting apparatus includes a mold for forming a continuous cast flat strip and which includes a plate cooler on each side, having means for circulating a cooling

medium therethrough. Each plate cooler includes at least one cooling media passage which has been admitted with a cooling medium for flow in a direction opposite the direction of the cast strip in a central zone, and then transverse to the direction of movement at the entrance end of the mold. The complete flow includes at least a partial flow along each side zone of the cooler in the direction of the travel of the strip. An alternate embodiment of the apparatus includes a single central flow passage for the cooling medium and a plurality of obliquely expanding transverse passages leading to end



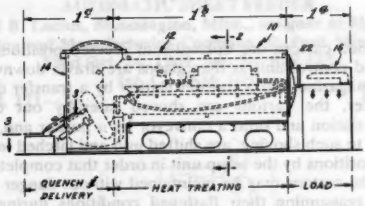
passages which extend in the direction of strip material flow. In accordance with the method the cooling medium is directed so that it will flow initially in a direction opposite to the direction of strip material movement in a central area, then in a direction transverse to the flow at the entrance end of the mold, and preferably in directions comparable to the direction of strip movement along each side edge of the mold. In a multiplied form of the method the transverse flow is divided up into a plurality of oblique transverse flow paths extending generally in a direction of the strip material advance.

3,625,499

FURNACE HAVING CONVEYOR WITH INTERMITTENT DRIVE

Herbert W. Westeren, Barrington; William H. Kimball, Providence, and Vincent Scotto, Warwick, all of R.I., assignors to C. I. Hayes Inc.

Filed Feb. 10, 1969, Ser. No. 797,832
Int. Cl. C21d *1/66*
U.S. Cl. 266—4 A **18 Claims**



A furnace construction for heat treating metallic articles and having a conveyor extending through the heating zone thereof, the conveyor being intermittently driven to provide for step-by-step advancement of the metallic articles through the heating zone.

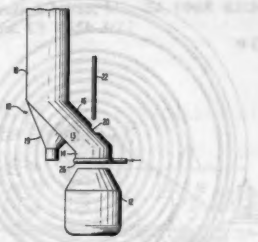
3,625,500

METALLURGICAL FURNACE FUME EXHAUSTING

James D. Bell, Weirton, W. Va., assignor to National Steel Corporation

Filed Nov. 17, 1969, Ser. No. 877,197
Int. Cl. C21c *5/42*
U.S. Cl. 266—35 **24 Claims**

Metallurgical furnace fume exhaust structure has membrane walls assembled from finned, watercooled, metal tubes. Studs are mounted on the walls in a pattern for retaining and supporting a layer of slag which is splashed from the furnace, deposited on the walls, and solidified by the cooling fluid. The slag is accumulated to form a continuous protective layer covering the portions of the walls which are subject to most severe deterioration by action of the exhaust fumes. A



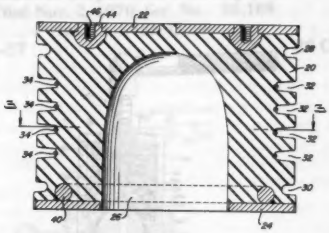
coating of corrosion-resistant metal protects the tubes from attack by the slag.

3,625,501

REINFORCED RUBBER SHEAR PAD

Richard D. Hein, 179 Shady Lane Drive, and Jerry D. Stringfellow, 880 Cambridge Drive, both of Wabash, Ind.

Filed Dec. 15, 1969, Ser. No. 884,930
Int. Cl. F16f *7/12*; **B61g** *7/12*
U.S. Cl. 267—153 **16 Claims**



An elastomeric shear pad is used to support and center the coupler arm of a railroad car. The pad, which supports the weight of the coupler arm, comprises an elastomeric cylinder the ends of which are bonded to a pair of mounting plates. The cylinder has a cavity extending in from one end thereof toward the other. The mounting plate at the open end of the cylinder is annular and the annulus communicates with this cavity. A torus or ring is secured to the inner surface of this plate, extending into and bonded to the elastomer. This torus serves to increase the bond area between the annular plate and the elastomer so that the area more nearly equals the total area of the bond between the cylinder and the other plate. The outer surface of the elastomeric cylinder contains a plurality of spaced grooves in which stiffening rings are positioned. These rings, made of steel or other high tensile strength material, serve to increase the compression resistance of the pad without adversely affecting the low shear rate thereof.

3,625,502

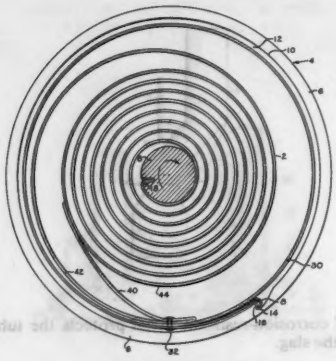
POWER SPRING WITH KEEPER AND BRIDLE

Robert E. Joerres, Bristol, Conn., assignor to Associated Spring Corporation, Bristol, Conn.

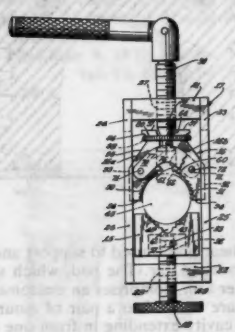
Filed Apr. 20, 1970, Ser. No. 30,182
Int. Cl. F16f *1/06*
U.S. Cl. 267—167 **4 Claims**

A spiral power spring has a keeper comprising an external annular band formed of spring steel having overlapping ends. The outer end of the power spring is reverse bent and the reverse-bent part is positioned between the outer and next

inner spring convolutions to form a bridle. The overlapping ends of the keeper, the outer spring convolution and the reverse-bent end part are connected together by a rivet or other connecting means.



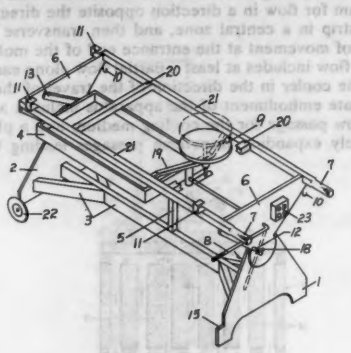
3,625,503
WORKPIECE HOLDER
Emery L. Hall, Hinsdale, Ill., assignor to Ram Tool Corporation, Chicago, Ill.
Filed Sept. 18, 1969, Ser. No. 859,015
Int. Cl. B25b *1/08*
U.S. Cl. 269—234 5 Claims



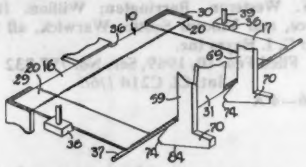
A workpiece holder or vise having opposed movable workpiece-grabbing jaws, the upper jaw consisting of two members pivotably connected by a common linkage. Each member has jaw teeth movable towards and away from the teeth of the other member whereby when the upper jaw is forced against the workpiece, the teeth exert independent pressure against the workpiece and attempted rotation of the workpiece in the jaw causes the jaw teeth to squeeze together against the workpiece.

3,625,504
TILTING DOOR TABLE
Garvie Walker, Rt. #4, Box 877, Lufkin, Tex.
Filed Dec. 10, 1969, Ser. No. 870,233
Int. Cl. B25j *5/00*
U.S. Cl. 269—55 2 Claims

A worktable relating to the act of simplifying the handling of doors while machining of hinge and lock recesses and conveying same to its installation location by one man. This device allows the door to be placed in a vertical position on its edge while machining one edge then with the use of a counterbalancing spring (which keeps one from lifting the entire weight of the door) turn the door to a horizontal position, reverse sides through the use of a turntable, and then place the door back in a vertical position to machine the other edge. After machining is accomplished, the door can be rolled on this device to its installation location.



3,625,505
MACHINE FOR ERECTING CARTONS
Robert F. Lense, Rockford, Ill., assignor to Riegel Paper Corporation
Original application Feb. 5, 1968, Ser. No. 703,135, now Patent No. 3,504,596. Divided and this application Dec. 4, 1969, Ser. No. 882,097
Int. Cl. B65h *3/08, 5/16*
U.S. Cl. 271—14 5 Claims

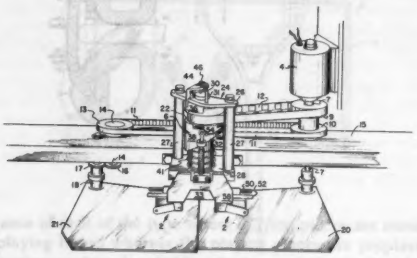


Flattened cartons are opened into erected positions by a setup and control unit as the cartons are drawn downwardly from a magazine into a transfer station by a transfer device. Thereafter, the cartons are shoved laterally out of the transfer station and onto a conveyor by a pusher and, as an incident to such shoving, are shifted into and latched in overcenter positions by the setup unit in order that complete control of the cartons may be maintained without danger of the cartons reassuming their flattened conditions during their transfer to the conveyor. A drive mechanism reciprocates the transfer device up and down between the transfer station and the magazine and operates with a differential action to cause the transfer device to dwell for a relatively long interval just below the cartons in the transfer station thereby to eliminate the need for precisely controlling the time of release of the cartons from the transfer device.

3,625,506
METHOD AND APPARATUS FOR DIFFERENTIATING THE TOP FIBROUS WORKPIECE FROM A STACK OF FIBROUS WORKPIECES AND FOR SEPARATING THE DIFFERENTIATED WORKPIECE FROM THE STACK
Herman Rovin, East Norwalk, Conn., assignor to Ivanhoe Research Corporation, New York, N.Y.
Filed Nov. 28, 1969, Ser. No. 880,769
Int. Cl. B65h *3/22*
U.S. Cl. 271—18 34 Claims

A method and apparatus for differentiating the top fibrous material workpiece from a stack of fibrous material work-

pieces and for separating the differentiated workpiece from the stack which operates reliably over long periods of time. A plurality of workpiece gripping means have a plurality of barblike members located thereon, the barblike members including stop surfaces on the lowest extremity and material or fiber-mass engaging elements on the outer extremity. The fiber-mass engaging elements on the barblike members on one of the gripping means extend outwardly in one direction while the fiber-mass engaging elements of the barblike members on another gripping means extend outwardly in the opposite direction. Drive means actuate the plurality of gripping means causing them to make depressed contact on the top workpiece and bulge up or mound up the surface of the material of the workpiece around the fiber-mass engaging



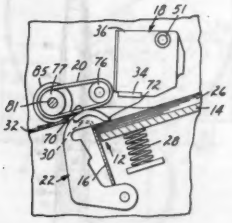
elements and to move relative to one another causing the fiber-mass engaging elements to engage the bulge of the material thus entering the mass or body of the material of the top workpiece and stretch or place under tension that portion of the material of the workpiece between the gripping means. The drive means causes relative movement of the gripping means away from the stack while continuing to engage the mass and the remainder of the the top piece. A separator plate means moves between the top workpiece and the remainder of the stack to complete the differentiation of the top workpiece from the stack. The plurality of gripping means move from the gripping position back to the initial position to release the material and stripping means strip the gripping means from engagement with the mass of the top workpiece.

3,625,507

AUTOMATIC SHEET FEEDER

Donald B. Lucius, Bloomington, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Oct. 24, 1969, Ser. No. 869,125
Int. Cl. B65h *3/20*
U.S. Cl. 271—33 **6 Claims**



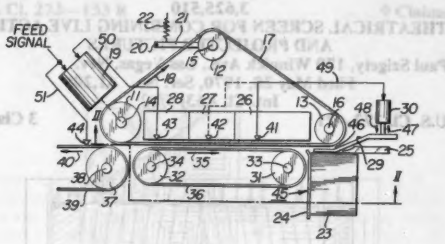
An automatic sheet separator and feeder in which an end of the uppermost sheet in a stack of sheets supported on a bottom wall of a tray is lifted over an abutment wall of the tray into contact with a driven member and a shoe is moved to position its toe over the stack of sheets to separate the lifted sheet from the remaining stack of sheets and its sole engaged with a driven member to place the lifted end of the sheet in driving engagement with the driven member to feed the sheet from the stack of sheets.

3,625,508

CARD-FEEDING APPARATUS

Yasuo Shiragai, Odawara-shi, and Mitsunori Oka, Kokubunji-shi, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed May 23, 1969, Ser. No. 827,195
Claims priority, application Japan, May 24, 1968, 43/34734
Int. Cl. B65h *3/12*
U.S. Cl. 271—34 **9 Claims**



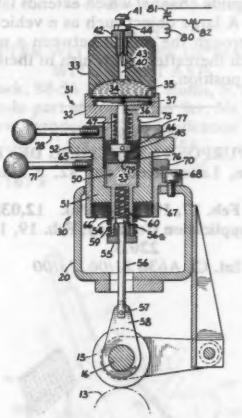
A card-feeding apparatus operative to hold individual cards stationary in a standby position intermediate of a card-feeding path after being drawn out from a hopper, and immediately thereafter feeding the individual cards in response to a card-feed command or the like.

3,625,509

CALIPER MECHANISM FOR LAPPED SHEETS FED TO A PRINTING PRESS OR THE LIKE

Clayton C. Claybourn, Northbrook, Ill., assignor to North American Rockwell Corporation, Pittsburgh, Pa.

Filed Nov. 2, 1970, Ser. No. 86,188
Int. Cl. B65h *43/04*
U.S. Cl. 271—57 **20 Claims**



A caliper mechanism for lapped sheets which uses, as a sensor, a chamber filled with conducting liquid and enclosed by a diaphragm which is acted upon by roller riding on the moving sheets. Extending from the chamber is a neck having a contact at its upper end, the cross section of the neck being only a small fraction of the area of the diaphragm so that as the roller rises a column of liquid rises in the neck at an amplified rate for making of contact. An individual sensing mechanism is distinguished by use of a cylindrical mount which is secured to supporting framework and which, in turn, serves to support a cylindrical sensing unit, the members being threadedly telescoped together to permit separate adjustment of normal roller position and the roller displacement necessary to cause contact. In the preferred construction two such mechanisms are coupled to separate rollers ar-

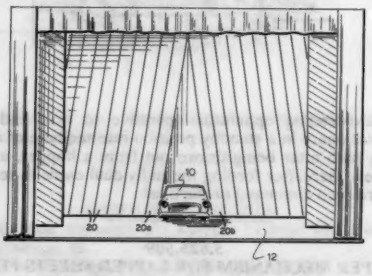
ranged end-to-end, each mechanism having a series of contacts at progressively higher level. Corresponding contacts in the two units are connected, as pairs, to output signal lines by logic circuitry so arranged that no signal is produced as long as the rollers occupy substantially the same level within the range of maximum anticipated thickness. At the end of each series is a final contact which bypasses the logic circuitry and which is capable of producing a signal for stopping the conveyor when the maximum anticipated thickness is exceeded.

3,625,510

THEATRICAL SCREEN FOR COMBINING LIVE ACTION AND PROJECTED PICTURES

Paul Szigety, 170 Winnick Ave., Las Vegas, Nev.

Filed May 28, 1970, Ser. No. 41,209
Int. Cl. A63j *5/02*
U.S. Cl. 272—21 **3 Claims**



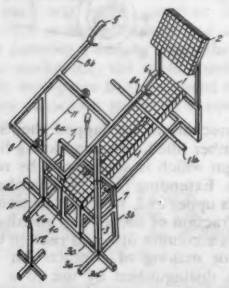
A theatrical screen for reflecting projected images and through which objects may pass comprises a plurality of substantially vertically extending elongated elastic strips the upper ends of which strips are secured to a frame while the lower ends are attached to movable guides. The guides are located within or cooperate with a guide channel and may be moved along the guide channel which extends laterally across a stage platform. A large object such as a vehicle or the like may be moved through the screen between a pair of parted elastic strips which thereafter will return to their normal substantially vertical position.

3,625,511

MILTIPURPOSE EXERCISING DEVICE

Willy Rennenann, Laves-Street no: 82, 3 Hannover, Germany

Filed Feb. 17, 1970, Ser. No. 12,038
Claims priority, application Germany, Feb. 19, 1969, P 19 08 220.3
Int. Cl. A63b *21/06, 23/00*
U.S. Cl. 272—58 **3 Claims**



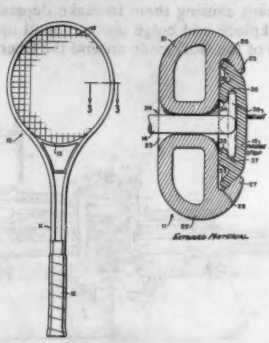
A combined sport apparatus including a flat bench, with an inclined arm support, elevated dumbbell supports and a weight-lifting pulley and line arrangement.

3,625,512

EXTRUDED RACKET HAVING TWO SEAMLESS HOLLOW TUBES FORMED WITH AN INTERCONNECTING WEB

Peter A. Latham, and Paul E. Brefka, both of LDA Inc., 39 Commercial Wharf, Boston, Mass.

Filed Jan. 26, 1968, Ser. No. 700,776
Int. Cl. A63b *49/02, 49/04, 49/12*
U.S. Cl. 273—73 C **13 Claims**



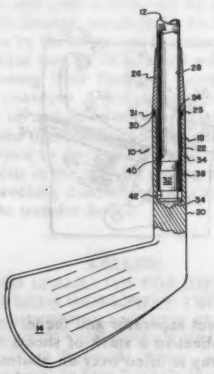
A racket is made of an aluminum extrusion having two seamless hollow tubes formed with a web of thickness that is more than twice the wall thickness of each tube and is drilled at intervals for receiving the racket strings. The cross-sectional dimension of the extruded racket in a direction perpendicular to the stringing plane is greater than the dimension parallel to the stringing plane. The outside portion of the extrusion is formed with upper and lower grooves for receiving a strip of flexible material that functions for improved balance and weight control and protecting the strings from abrasion, dirt and moisture. The flexible strip may function to help balance and control the weight of the racket through its own weight, supplemented, if necessary, by weights that it may carry.

3,625,513

HEAD-TO-SHAFT CONNECTION FOR GOLF CLUB

James E. Ballmer, Cincinnati, Ohio, assignor to Brunswick Corporation

Filed Aug. 2, 1968, Ser. No. 749,675
Int. Cl. A63b *53/02*
U.S. Cl. 273—80.5 **6 Claims**



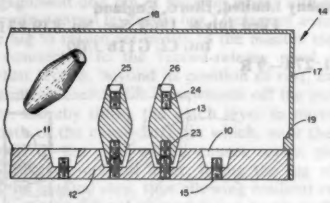
A head-to-shaft connection for a golf club wherein the end of the golf club shaft is inserted in the bore in the club head hosel and initially positioned therein by means of radial

spacer elements, the shaft being secured in the bore by suitable cementitious means. After the cementing means sets, it also holds the club shaft in the desired position.

3,625,514
GAME BOARD WITH MEANS FOR PREPLACING PLAYING PIECES

Carsten M. Haaland, 259 East Drive, Oak Ridge, Tenn.

Filed Aug. 13, 1970, Ser. No. 63,506
Int. Cl. A63f 9/06
U.S. Cl. 273—95 R **3 Claims**

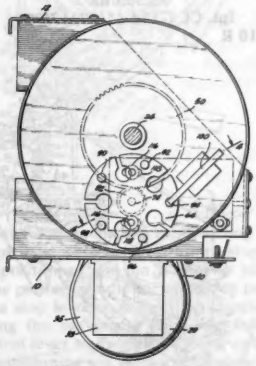


A game of skill of the type where playing pieces are moved on a playing board wherein the playing pieces are preplaced in a starting position by shaking the board to cause the playing pieces to be reoriented on the board until the proper position is attained and thereafter maintaining the piece in those proper positions by magnetic means associated with the positions and the playing pieces. A transparent removable cover prevents loss of the playing pieces during shaking and permits viewing the position of playing pieces. Thus, in addition to the skill of playing the game has been added the skill and chance of prepositioning the playing pieces.

3,625,515
RANDOM GENERATOR

Carl D. Calos, Northridge, and Larry Lloyd Main, North Hollywood, both of Calif., assignors to Centaur Mine Computer Devices, Inc., New York, N.Y.

Filed June 2, 1969, Ser. No. 829,183
Int. Cl. A63f 5/04
U.S. Cl. 273—143 C **18 Claims**

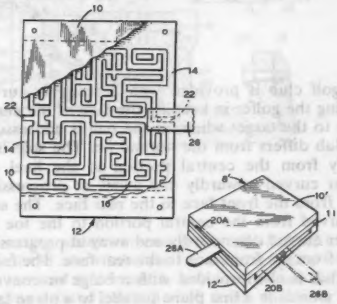


A random generator is described which includes a plurality of rotatably mounted indicia reels. A stopping disc is mounted to rotate with each reel and has a plurality of equally spaced magnetic slugs disposed about the circumference thereof. An electromagnet is placed in close proximity of each stopping disc and adapted to be randomly energized to engage one of said plurality of magnetic slugs. The stopping disc is adapted to rotate at a rate faster than the indicia reel. Adjustment is provided between the stopping disc gear and corresponding gear of an indicia reel.

3,625,516
INVISIBLE MAZE PUZZLE

Martin J. Handweiler, and Kenneth R. Wisner, both of New York, N.Y., assignors to Black Tulip Toy Company, Inc., New York, N.Y.

Filed Jan. 26, 1970, Ser. No. 5,803
Int. Cl. A63f 9/06
U.S. Cl. 273—153 R **9 Claims**

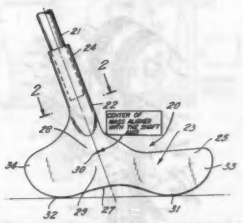


A maze puzzle relying on the sense of touch of the player comprises a flat container of opaque material. On the inner surfaces of the top and bottom of the container are mazes. Slots in the opposite sidewalls of the container permit the passage of a flat rod, having a stud on one end thereof, into the pathways of the mazes so that depending on how the rod is inserted a different maze puzzle is available.

3,625,517
GOLF PUTTER WITH CENTER OF MASS ALIGNED WITH SHAFT AXIS

John E. Durnack, 88-56 195th St., Hollis, N.Y.

Continuation-in-part of application Ser. No. 712,849, Mar. 13, 1968, now abandoned. This application Nov. 10, 1969, Ser. No. 875,454
Int. Cl. A63b 53/04
U.S. Cl. 273—167 F **1 Claim**



A golf club which includes a shaft having an upper end with a gripping surface and a lower end adapted to be mounted to the shank portion of a head. The head has the shank portion extending upwardly from its upper surface intermediate the ends thereof. The head also has a striking face thereon and an arcuate recess on its undersurface along with an upward projection extending from its upper surface. The recess and the projection are proximal to the substantially vertical axis and the extension thereof of the shank part of the head.

3,625,518

GOLF CLUB HEAD WITH COMPLEX CURVATURE FOR THE SOLE AND/OR THE STRIKING FACE

Karsten Solheim, 10834 North 21st Avenue, Phoenix, Ariz.

Filed May 23, 1969, Ser. No. 827,212
Int. Cl. A63b *53/04*
U.S. Cl. 273—175 7 Claims

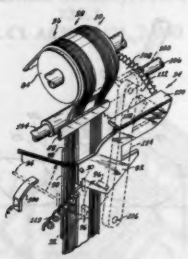
A golf club is provided with a uniquely curved sole for assisting the golfer in keeping the face of the club pointed in a line to the target when, as the ball is addressed, the lie of the club differs from the normal lie. The sole is curved upwardly from the central portion to the heel portion and further curved upwardly and away, at progressively greater rates, from the front face to the rear face. The sole may also be curved from the central portion to the toe portion and further curved downwardly and away at progressively greater rates, from the front face to the rear face. The face of a wood golf club is also provided with a bulge or convex curvature about an axis in a first plane parallel to a plane tangent to the center of the club face and lying in a second plane parallel to the club shaft and passing through a line between the center of the club face and the target at the time of addressing the ball, and a roll or convex curvature about an axis perpendicular to the bulge axis curvature. The radius of curvature for roll is less than for bulge. The rear of the wooden head is extended and tapered, and concentrated weights are placed as much in the toe and the extended rear portion of head as possible.

3,625,519

RANDOM PLAYBACK MECHANISM FOR PHONOGRAPH DEVICE

Berne E. Danielsen, Pacific Palisades; Reginald M. Dowsing, Torrance; Melvin R. Kennedy, Compton, and John W. Ryan, Los Angeles, all of Calif., assignors to Mattel, Inc., Hawthorne, Calif.

Original application Jan., 1968, Ser. No. 699,653, now Patent No. 3,482,842, dated Dec. 9, 1969. Divided and this application Sept. 2, 1969, Ser. No. 854,515
Int. Cl. G11b *25/06, 21/08*
U.S. Cl. 274—1 A 7 Claims



The record is a flexible endless record tape or band which has a plurality of parallel sound tracks over substantially the entire length thereof. At the juncture between the beginning and ends of these sound tracks a transition section means or guide track means cooperates with all of the sound tracks to carry the stylus to one side of the record. At least one hole is punched through the record where the guide track is at one side of the record.

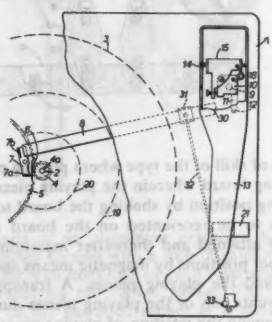
The random playback mechanism has a stylus which is continuously engaged in either one of the sound tracks or the guide track, depending upon its relative position. During normal play it is in one of the sound tracks, and when the end of play is reached, the guide track carries the stylus to one side. A pin engages the hole in the record, which pin is connected to a pawl which spins a random cam. The cam acts as a stop for transverse motion of the stylus as it is moving out of the guide track into one of the sound tracks so that, as the stylus engages the cam as a stop, the next sound track to be played is randomly selected.

3,625,520

GRAMOPHONE RECORD PLAYERS

Alan W. Say, Ilford, Essex, England, assignor to The Plessey Company Limited, Ilford, England

Filed July 8, 1969, Ser. No. 839,831
Int. Cl. G11b *3/00*
U.S. Cl. 274—9 R 3 Claims



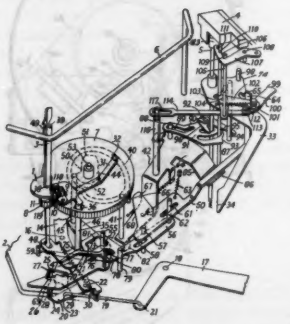
A record player has a flexible arm associated with the tone arm which can be selectively interposed between an adjusting screw and a pivot structure for changing the relation between the tone arm which is suitable for playing 7 inch, 10 inch or 12 inch records to one suitable for playing 3⅞ inch diameter records.

3,625,521

RECORD-CHANGER GRAMOPHONES

Edward William John Caddy, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

Filed Nov. 12, 1969, Ser. No. 875,611
Claims priority, application Great Britain, Nov. 12, 1968, 53,593/68
Int. Cl. G11d *15/00, 17/00*
U.S. Cl. 274—10 R 4 Claims



In an automatic record changer in which the pickup-arm movements are controlled by a cam groove and the record release mechanism is operated by a circumferential cam, the engagement of the cam-trip pawl at the beginning of automatic play, the transfer of the hand-control lever from an AUTO position to a MANUAL position during the first

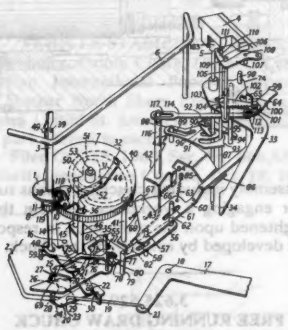
revolution of the cams, and the retention of the pickup arm in the rest position and eventual switching off of the motor at the end of a revolution in which no record is available on the shoulder of the record spindle, is effected with the help of a cycle-control lever capable of pivotal movement about and longitudinal movement relative to a fulcrum pin, this lever having an edge formed with a sawtooth whose face causes the cycle-control lever to follow the longitudinal movement of a catch lever linked to the switch lever as the latter is moved by a hand lever from OFF position to a manual or auto position and retained there by steps in an aperture of the mounting plate, movement of the cycle-control lever to the latter position producing, via a resilient cam member, engagement of the trip pawl for a revolution of the cam wheel, whereafter engagement of a pin of the cam wheel with a cam acting on the cycle-control lever lifts lug 24 clear of auto step 29 causing the lug to return resiliently to the manual step. A release lever connected to the record-release pawl, after release of the last record, beyond its position of rest, engaging the cycle control lever to lift its sawtooth off the pawl of the catch lever, thereby tilting the catch lever to move the cam into the path of the cam-wheel pin which, near the end of the revolution of the cam wheel, causes return pivotal movement of the cycle-control lever, lifting the lug of the catch lever off the manual step, thus allowing resilient return of the switch lever and hand-control lever to their STOP positions.

3,625,522

PICKUP ARM ACTUATING MECHANISM FOR AUTOMATIC RECORD CHANGERS

Edward Thomas Humby, Ilford, England, assignor to The Plessey Company Limited, Ilford, England

Filed Nov. 12, 1969, Ser. No. 875,612
Claims priority, application Great Britain, Nov. 12, 1968, 53,594/68
Int. Cl. G11d *15/00, 17/00*
U.S. Cl. 274—10 R **7 Claims**



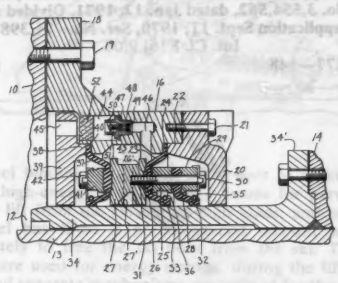
A selector cam varies according to its setting position, the distance of the pivot of a stop lever having a stop face at end, from a pickup-positioning pin on a pickup plate pivotally movable with the pickup spindle for any given position of the pickup arm. The stop lever is lost-motion coupled to a drive lever transmitting the movement of a cam-follower to the pickup arm control lever so as to move the stop lever clear of the path of the positioning pin during the outward movement of the pickup arm and producing, before the stop face of the stop lever is withdrawn from this path to permit playing of a record, a wiping movement of this face, this face being cam-shaped to first ensure engagement of the pickup-positioning pin with the record groove and then gradually release any resilient forces built up during this initial period. Friction drive for the pickup plate during the positioning movement is effected by a return arm which is friction-pivoted to the pickup arm control plate and which, at the beginning of the inward movement, clasps a pin of the pickup plate in pincer fashion.

3,625,523

AFT SEALING ASSEMBLY FOR STERN TUBES

Willis W. Gardner, Waukesha, and Richard L. Rafferty, Menomonee Falls, both of Wis., assignors to Waukesha Bearings Corporation, Waukesha, Wis.

Filed Feb. 13, 1970, Ser. No. 11,098
Int. Cl. F16j *15/32*
U.S. Cl. 277—59 **3 Claims**



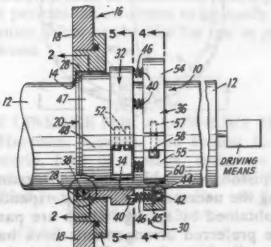
An annular casing which surrounds the tail shaft of a ship at the aft end of the stern tube has an annular space within which inner, outer and intermediate annular lip seals are supported for sealing around the tail shaft liner, the inner seal having its lip projecting in a forward direction and the intermediate and outer seals having their lips projecting in an aft direction. There is communication between the stern tube oil chamber and the forward side of the inner seal, and there is valve-controlled communication between the stern tube oil chamber and an annular pocket between the inner and intermediate seals. The valve is actuated by the pressure difference between the pressure in said annular pocket and the pressure in the stern tube oil chamber.

3,625,524

ROTATABLE SEAL

Melvin Vergales, Richmond, Va., assignor to AMF Incorporated

Filed Aug. 13, 1970, Ser. No. 63,358
Int. Cl. F16j *15/34*
U.S. Cl. 277—115 **8 Claims**



A sealing member constructed and arranged to be abutably mounted on a rotatable shaft which extends through an opening formed in a housing, and abutably mounted against the housing, to close the space between the housing and shaft. The sealing member has shaft and housing sealing surfaces and, spaced apart from both of them, a surface which is angularly related to the sealing surfaces. The latter surface is angled such that a force applied to it to abutably mount the shaft and housing seals in place, tends to cause the sealing member to rotate with the shaft. The aforesaid latter surface is spaced apart from the sealing faces so that the sealing member may be held in place by apparatus which is also spaced apart from the sealing faces, rather than by apparatus which encloses the sealing member in a cavity adjacent the space between the housing and shaft. As a consequence, the

sealing member is constructed and arranged to allow fluid from within the housing which seeps past the sealing faces to freely flow away from the sealing member.

3,625,525

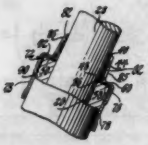
VALVE STEAM SEAL ASSEMBLY

Carlisle R. Davis, Jr., Grand Blanc, Mich., assignor to General Motors Corporation, Detroit, Mich.

Original application June 21, 1967, Ser. No. 647,674, now Patent No. 3,554,562, dated Jan. 12, 1971. Divided and this application Sept. 11, 1970, Ser. No. 71,398

Int. Cl. F16j *9/06*

U.S. Cl. 277—148 **5 Claims**



A valve stem seal assembly formed from a thin sheet of wear-resistant filled Teflon assembled with a sheet metal retainer to provide an extended lip urged to sealing engagement with the valve stem by resilient fingers of the retainer and having means to seal against and retain the assembly on the valve guide. One embodiment is installed on the valve guide in a partially formed state and the final configuration of the lip and resilient fingers is formed after assembly to correct for eccentricity of the valve guide and the seal mounting.

3,625,526

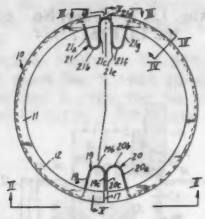
UNITARY SELF-ENERGIZING OIL CONTROL RING

Harold E. McCormick, Ballwin, Mo., assignor to Ramsey Corporation, St. Louis, Mo.

Filed Nov. 14, 1969, Ser. No. 876,889

Int. Cl. F16j *9/06*

U.S. Cl. 277—151 **8 Claims**



Oil control piston rings which have self-expanding properties eliminating the necessity for backup expander rings. The expansion is obtained by springs which are part of the ring structure. The preferred arrangements have hairpin springs projecting inwardly from the oil ring which, in use, extend through the oil drainage slots of the piston ring groove.

3,625,527

ENGINE GASKET

Brian N. Brindle, Thundersley, England, assignor to Ford Motor Company, Dearborn, Mich.

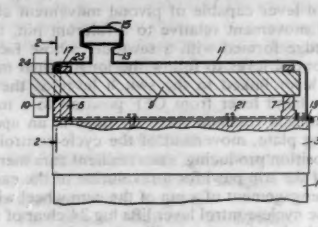
Filed Mar. 26, 1970, Ser. No. 22,947

Claims priority, application Great Britain, July 15, 1969, 35,463/69

Int. Cl. F16j *15/10*

U.S. Cl. 277—227 **9 Claims**

A gasket of particular value for use in an overhead camshaft engine. Gasket provides a seal between cylinder head boss in which camshaft is journaled and rocker cover, and between the cylinder head and rocker cover. Part of the gasket between boss and rocker cover is made of a softer material than is part between cylinder head and rocker cover. Gasket may be made from mixtures of rubber and cork granules, the relative hardness properties being determined by proportions of rubber and cork used, and by the hardness of the rubber compounds used in the respective parts of the gasket.



3,625,528

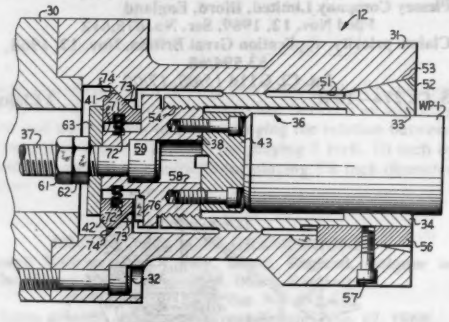
CHUCK ASSEMBLY WITH CENTRIFUGAL TIGHTENING MEANS

Ira H. Sage, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 20, 1970, Ser. No. 12,909

Int. Cl. B23b *31/14*

U.S. Cl. 279—1 C **7 Claims**



A chuck assembly including chucking means such as a collet sleeve for engaging a workpiece wherein the chucking means are tightened upon the workpiece in response to centrifugal force developed by rotation of the chuck.

3,625,529

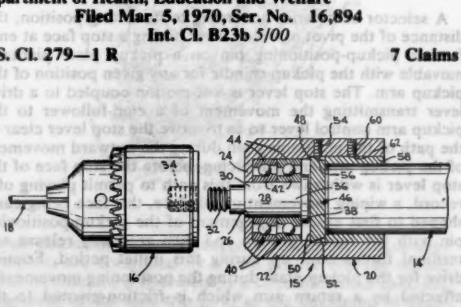
FREE RUNNING DRAW CHUCK

James H. Donachy, Wheaton, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare

Filed Mar. 5, 1970, Ser. No. 16,894

Int. Cl. B23b *5/00*

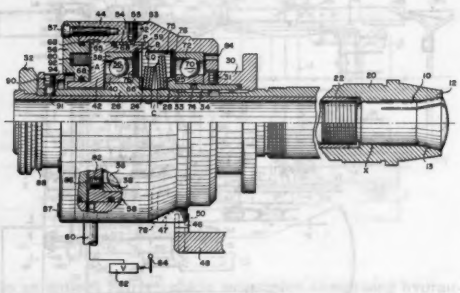
U.S. Cl. 279—1 R **7 Claims**



Free running draw chuck device for use in a lathe permitting rotation of an elongated, relatively fine workpiece or

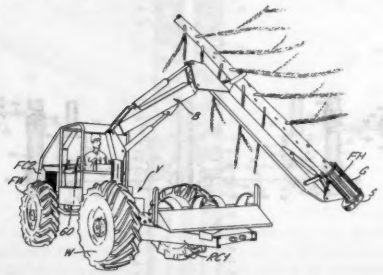
mandrel at high speeds under tension without deviation or "whipping." Use of the device in formation of fine, wire reinforced catheters is shown.

3,625,530
COLLET ACTUATING DEVICE
Hubert J. Parsons, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.
Filed Oct. 13, 1969, Ser. No. 865,556
Int. Cl. B23b *31/30*
U.S. Cl. 279—4 10 Claims



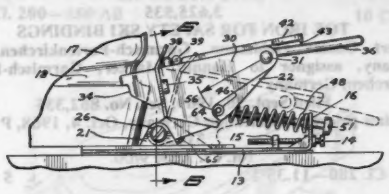
A collet actuating device including two concentrically arranged tubular members one of which is movable axially and annularly relative to the other; a Belleville spring connected to both of the tubular members for exerting pressure axially on each of the tubular members and in opposite directions for actuating a collet; a piston connected to one end of the Belleville spring for relieving pressure exerted by the spring on one of the tubular members; and a locking means for arresting movement of the tubular members annularly relative to each other.

3,625,531
VEHICLE STABILIZING MEANS
Raoul Ranzenhofer, Pointe Claire, Quebec, Canada, assignor to Canadian International Paper Company, Montreal, Quebec; Quebec North Shore Paper Company, Montreal, Quebec and Abitibi St. Anne Paper Ltd., Beaupre, Quebec, Canada, part interest to each
Filed Oct. 15, 1969, Ser. No. 866,655
Claims priority, application Canada, Oct. 18, 1968, 032876
Int. Cl. B60s *9/00*
U.S. Cl. 280—6 3 Claims



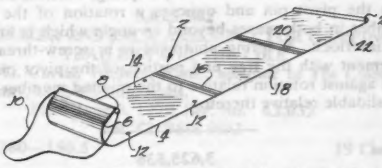
A log-handling vehicle consisting of a felling head attached to the free end of an extendible and retractable boom carried by the vehicle which preferably is of the articulated type. To restrain tipping force the stabilizing is provided in the form of a spring or rubber pad for engagement with an abutment upon a selected degree of roll, of the vehicle. The rubber pad preferably is secured to the chassis and engageable with an axle pivotally attached to such chassis and carried by ground engaging means such as wheels.

3,625,532
HEEL BINDING FOR SKI
Edward A. Pauls, Excelsior, Minn., assignor to Sports Technology, Inc., South Edina, Minn.
Filed Nov. 14, 1969, Ser. No. 876,711
Int. Cl. A63c *9/084*
U.S. Cl. 280—11.35 T 20 Claims



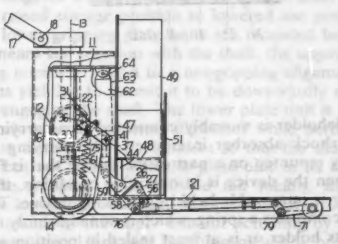
A heel binding for holding a ski boot to a ski which includes high-energy storage spring means for permitting the heel to lift from the ski during high loads, and which when the heel has lifted a predetermined amount will release completely to free the ski boot from the ski. Torsion bar means are used for energy storage, during the lifting of the heel, and separate mechanisms are utilized for the release action after the heel has lifted a predetermined distance.

3,625,533
EASILY CARRIED TOBOGGAN-LIKE STRUCTURE
Richard Boe, Stay, Wyo., assignor to Bernard T. McManus and Gordon Shipman, part interest to each
Filed Sept. 15, 1969, Ser. No. 857,773
Int. Cl. B62b *13/16*
U.S. Cl. 280—18 8 Claims



An easily transported and foldable tobogganlike structure or carryall comprising several hingedly attached panel members having a tobogganlike configuration and preferably of a lightweight material such as aluminum with a pair of carrying means which permits the structure to be easily carried on the back of a hunter, hiker or the like for use in primarily snow-covered environs.

3,625,534
LIFT LINKAGE FOR A LOW-LIFT TRUCK
William J. Harrison, Guelph, and Dennis G. Harvey, Ancaster, Ontario, both of Canada, assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.
Filed June 10, 1970, Ser. No. 44,946
Int. Cl. B62d *21/18*
U.S. Cl. 280—43.12 5 Claims



The elevating platform of a low-lift-type lift truck is connected to the frame of the truck through a pair of parallel

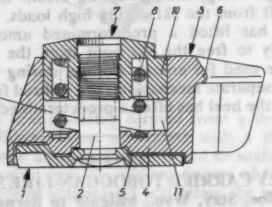
links which are spaced vertically and longitudinally from one another. The lower pair of links are disposed below a battery support and the upper pair of links are disposed forwardly of the battery. A single upstanding hydraulic jack is employed to raise and lower the load carrying platform through a connection with the lower pair of links.

3,625,535

TOE IRON FOR SAFETY SKI BINDINGS

Albert Gustav Oehlmann, Garmisch-Partenkirchen, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany

Filed Sept. 30, 1969, Ser. No. 862,335
Claims priority, application Germany, Oct. 4, 1968, P 18 01 314.4
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **5 Claims**



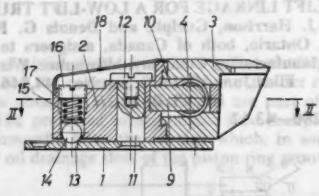
A baseplate has a vertical pivot pin on which a pivoted member is rotatably mounted, which is releasably interlocked with the baseplate and biased by a spring, which is concentric with the pivot pin and opposes a rotation of the pivoted member in both senses beyond an angle which is limited by the interlock. A spring abutment is in screw-threaded engagement with the free end portion of the pivot pin and is held against rotation relative to the pivoted member but axially slidable relative thereto.

3,625,536

TOE- OR HEEL-HOLDING FOR SAFETY SKI BINDINGS

Hannes Marker, Hauptstrasse 51-53, Garmisch-Partenkirchen, Germany

Filed Oct. 28, 1969, Ser. No. 871,909
Claims priority, application Germany, Nov. 12, 1968, P 18 08 466.7
Int. Cl. A63c 9/00
U.S. Cl. 280—11.35 T **3 Claims**



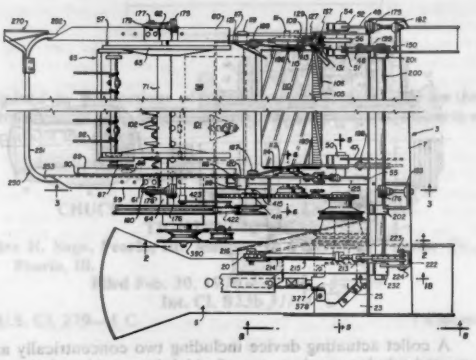
A soleholder is movably connected to a carrying member with a shock absorber interposed. The carrying member is movably mounted on a part of the device that is fixed to the ski. When the device is in operative condition, the carrying member is immovably held by a locking device. The locking device comprises a spring, which is nonadjustably mounted in or on its holder or is at least sealed in position when it has been adjusted to determine a desired release hardness. The shock absorber comprises readily adjustable adjusting means to vary the damping.

3,625,537

TOOLBOX IN FRAME AND FRAME STRUCTURE FOR MOWER CONDITIONER

James H. Bornzin, La Grange; Arthur H. Keller, and Peter J. Peacock, both of Western Springs, all of Ill., assignors to International Harvester Company, Chicago, Ill.

Filed Feb. 5, 1970, Ser. No. 9,027
Int. Cl. A01d 57/00
U.S. Cl. 280—80 R **5 Claims**



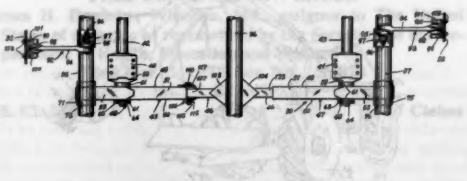
A frame structure for a mower conditioner having a transverse frame element with dependent arms extending downwardly and forwardly. Saddles are provided on the arms for pivotally mounting a harvesting unit thereon for pivoting about a horizontal transverse axis. The transverse frame element is integrated at one end into the upper end of a vertically disposed box section end frame structure which has an opening in the rear providing a toolbox and which in front provides an enclosure of a gearbox drive and which at its lower end is integrated with the rear end of a fore-and-aft extending box section draft frame.

3,625,538

TRIAXLE SUSPENSION ASSEMBLY

John E. Raidel, Springfield, Mo., assignor to Ridewell Corporation, Springfield, Mo.

Filed Oct. 6, 1969, Ser. No. 864,136
Int. Cl. B60g 19/00
U.S. Cl. 280—104.5 **10 Claims**



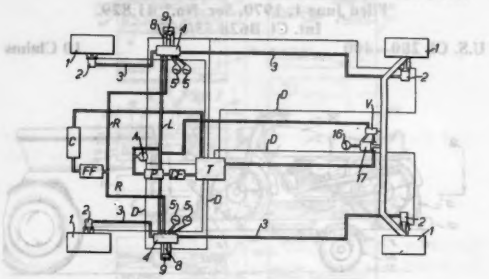
A suspension assembly for triaxle installation having front, central and rear beams connected to the front, central and rear axles. The front and rear beams are oscillating beams pivotally mounted on pedestals depending from the vehicle frame. The central beam is free floating but is pivotally connected to the front beam and bears upwardly against the rear beam for equalization of loads through the beams to the three axles. All beams are rubber-bushing mounted for self-tracking. The front beams serve as radius rods for the central axle, eliminating the need for a separate radius rod to be connected to the central axle.

3,625,539

VEHICLE SUSPENSIONS

Stephen J. Crouch, Warwickshire; Peter W. R. Stubbs, Warwick, and Michael W. Lewis, Warwick, all of England, assignors to The Rover Company Limited, Solihull, England

Filed Aug. 19, 1969, Ser. No. 851,392
Claims priority, application Great Britain, Aug. 20, 1968, 39,773/68
Int. Cl. B60g 17/04
U.S. Cl. 280—112 R 8 Claims



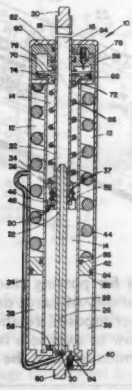
In an antiroll active vehicle suspension comprising hydraulic struts in series with springs, preferably gas springs, with the flow of fluid to and from the struts controlled by control units responsive to lateral acceleration. The struts for all the wheels on each side of the vehicle are controlled by a single unit common to that side of the vehicle. Where the vehicle is a road vehicle with steered front wheels the control units are near the front of the vehicle and respond to a feedback signal from the suspension linkage of the adjacent front wheel. The feedback signal is preferably through a spring and damper in parallel. There can be damping restrictions between the struts and air springs, and in pipes interconnecting the hydraulic systems of the different struts.

3,625,540

HYDRAULIC SUSPENSION UNIT

David E. Jewell, Littleton, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed June 22, 1970, Ser. No. 48,347
Int. Cl. B60g 11/58
U.S. Cl. 280—124 F 3 Claims



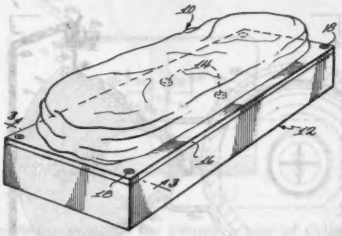
A load-leveling hydraulic suspension unit of low spring rate having a hydraulic circuit that includes a fluid reservoir, a self-contained pumping system, a high-pressure chamber, a spring-biased pressure-regulating chamber, and interconnecting fluid passageways with flow-regulating valves and seals. A hydraulic suspension unit which provides load-leveling forces at a low spring rate.

3,625,541

INFLATING MECHANISM FOR VEHICLE SAFETY CRASH BAG

Wallace N. Frazier, 102 Highland Ave., Smyrna, Tenn.

Filed July 31, 1970, Ser. No. 59,875
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 10 Claims



A trigger and inflating mechanism for an inflatable safety crash bag of the type which automatically inflates so as to protect a vehicle passenger in the event of a crash comprises a housing containing a rupturable source of gas pressure, a piercing element spring-biased toward the source, and a sear element restraining the piercing element in spaced relationship to the source. The sear element is a rigid projection on a movable inertia member, the latter being restrained against movement by frangible plastic tabs which break upon the inertia member's undergoing a predetermined deceleration.

3,625,542

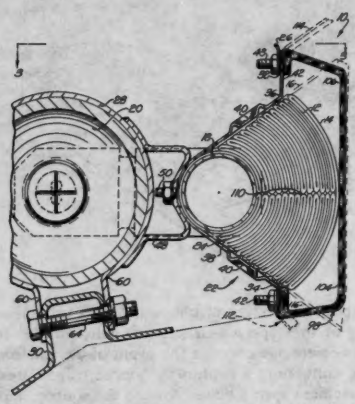
STABILIZER AND JACK ASSEMBLY FOR CAMPING TRAILERS AND THE LIKE

Richard D. Curtis, Wichita, Kans., assignor to The Coleman Company, Inc., Wichita, Kans.

Filed June 3, 1970, Ser. No. 43,032
Int. Cl. B60s 9/02
U.S. Cl. 280—150.5 19 Claims

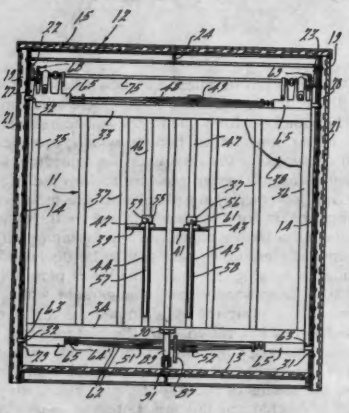
The combination stabilizer and jack is designed for integration with the frame members of a vehicle adjacent its underside. The brackets for attachment to the vehicle frame includes upper and lower flanges which provide vertically aligned openings for slidably receiving an upright shaft movable from a raised storage position to lowered use positions. Upper and lower gripping plate units are mounted between the flange means for coaction with the shaft, the upper plate means being normally biased to a nongripping alignment by spring means yielding to permit it to be downwardly canted for bitingly engaging the shaft. The lower plate unit is spring biased to a downwardly canted alignment while permitting adjustment to a nongripping alignment so that the shaft can be lowered but not raised with the plate unit in its normal position. The gripping units provide tab means, the tab means of the lower unit being adapted for manual operation, and the tab means of the upper unit for actuating by a tool through a mechanical linkage. Latching means is provided for releasably securing the shaft in its raised storage position, and cover and gasket means are provided for protecting the operative mechanism within the bracket from weather and dirt.

3,625,543
SAFETY APPARATUS
Donald H. Wolff, Farmington, Mich., assignor to Eaton Yale & Towne Inc., Cleveland, Ohio
Filed Sept. 15, 1969, Ser. No. 857,774
Int. Cl. B60r 21/08
U.S. Cl. 280—150 AB 3 Claims



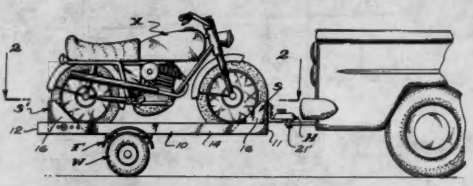
A safety apparatus for protecting an occupant or occupants of a vehicle during a collision includes a confinement having a collapsed condition and an expanded condition for restraining movement of the occupant during an accident. The safety apparatus also includes structure providing a fluid supply for inflating the confinement and a diffuser means in fluid communication with the structure and the confinement to direct fluid from the structure to expand the confinement from the collapsed condition to the expanded condition. The safety apparatus also has a housing means, a portion of which defines a chamber for receiving the diffuser means and the confinement when in the collapsed condition. The housing means also includes means for attaching the fluid supply externally thereof. The safety apparatus is constructed as a unitized assembly for installation in a vehicle.

3,625,544
TRUCK-TRAILER REAR DOOR PROTECTOR
Gordon W. Goodwin, and Robert D. Downs, both of Jackson, Mich., assignors to Aeroquip Corporation, Jackson, Mich.
Filed Oct. 22, 1969, Ser. No. 868,488
Int. Cl. B60p 7/14
U.S. Cl. 280—179 R 7 Claims



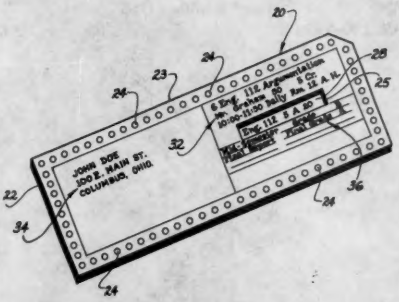
A movable bulkhead for holding the cargo of a truck-trailer in position. The bulkhead is hinged at the top and has latches in the four corners operable by two swinging arms mounted on the bulkhead itself. In its operative vertical position, the bulkhead rolls on a pair of upper tracks, and it stores beneath the trailer roof. The bulkhead may be released in stepwise fashion from its holding position. All parts of the bulkhead are captive and not subject to loss.

3,625,545
MOTORCYCLE TRAILER
Howard Somers, and Hugh D. Wolcott, both of 6343 Geiser Ave., Reseda, Calif.
Filed June 1, 1970, Ser. No. 41,829
Int. Cl. B62d 53/00
U.S. Cl. 280—400 10 Claims



A trailer adapted to be releasably coupled with and towed by a draft vehicle and which is adapted to support and carry one or more motorcycles; the trailer comprising a foldable frame and axle assembly, removable wheel and mudguard assemblies and adjustable trailer hitch means and wheel stop means whereby the trailer can be adjusted to cooperatively receive and support motorcycles of different size, be engaged with draft vehicles with trailer hitch means at different heights and such that the trailer can be easily folded and dismantled for easy and convenient handling and storing when not in use.

3,625,546
FORM SET
Clyde M. Evans, Box 268, Rio Grande, Ohio
Filed Apr. 29, 1969, Ser. No. 820,129
Int. Cl. B41l 1/24
U.S. Cl. 282—23 R 1 Claim

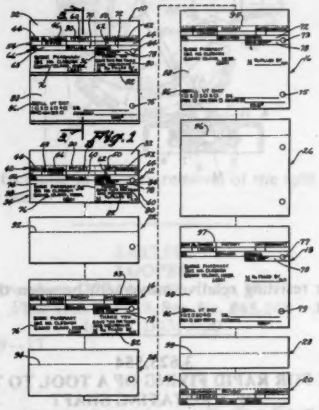


A form set adapted for posting student grades or the like characterized by a plurality of cards detachably connected to one another in a superimposed relationship with each card provided with a window to expose a label portion removably mounted on the lowermost card in the set.

3,625,547
COMPOSITE PRESCRIPTION FORM
William A. Burke, 1812 N. Cleburn, Grand Island, Nebr.
Filed May 9, 1969, Ser. No. 826,066
Int. Cl. B41l 1/24
U.S. Cl. 282—23 6 Claims

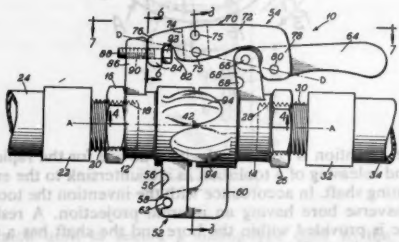
A composite prescription form comprising five individual form parts which are detachably secured together at their

upper ends in a superposed relationship with respect to each other. The prescription form contains a plurality of preprinted information and the pharmacist types the form upon receiving a new prescription. The form is then separated with one portion of the first or top part being used as a prescription label and the other portion of the first part being filed for daily computation and record. The second part of the form is a sack label with the third part of the form



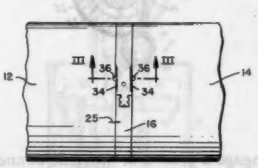
being the prescription itself. The fourth part of the form is identical to the third part and provides a copy of the original prescription. The fifth part of the form is a three-line part which is separable from the form so that it may be secured to a permanent patient prescription ledger card. A modification of the form is also disclosed and is designed for use as a refill prescription form. The modification utilizes three parts which are substantially identical to parts 1; 2 and 5 of the first described forms, respectively.

3,625,548
QUICK CONNECT AND DISCONNECT COUPLING
Frank J. Boehm, St. Louis, Mo., assignor to Sharyl A. Craggs, Taylorville, Ill.
Filed Aug. 24, 1970, Ser. No. 66,280
Int. Cl. F16l *35/00*
U.S. Cl. 285—27 **5 Claims**



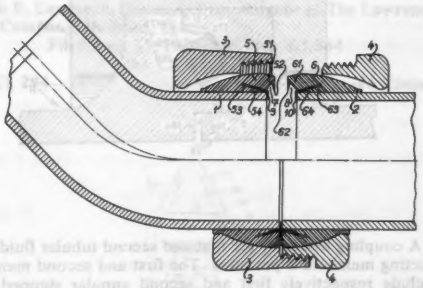
Coupling has two tubular body sections. When assembled, the sections are axially aligned, with abutting, coextensive, resilient, rubberlike gasket rings providing a rubber-to-rubber seal. The body sections have open areas completely surrounding the gasket rings to prevent fouling of the seal by accumulation of foreign material. A detachable pivot on one side of the coupling and a detachable toggle on the other side hold the body sections assembled. The coupling is disassembled and the body sections separated by releasing the toggle. The body sections are aligned, automatically, during assembly, by the pivot, which restrains relative movement in one transverse direction, and guide lugs which restrain relative movement in another transverse direction. Compression of the gasket rings and hence effectiveness of the seal, is adjusted by a threaded connection between the toggle and one of the body sections.

3,625,549
STRAP RING CONNECTOR
Gerrit De Vries, 2902 N. Stonehill Drive, Altadena, Calif.
Filed Feb. 9, 1970, Ser. No. 9,707
Int. Cl. F16l *21/06*
U.S. Cl. 285—39 **6 Claims**



A strap ring connector for joining a pair of cylinder ends including: a strap which is capable of forming a ring, the strap, in its ring configuration, having internal and external surfaces; one side of the internal surface of the strap having grooves therealong and the other side of the internal surface having threads so that the grooves and the threads of the strap are capable of mating engagement with corresponding grooves and threads of the respective cylinders; and means for securing the strap in a ring configuration about the cylinder ends.

3,625,550
UNION JOINT FOR TUBING
Edouard Beyeler, Chemin de la Preville 10, 1510 Moudon, Switzerland
Filed Oct. 31, 1969, Ser. No. 872,930
Int. Cl. F16l *17/00*
U.S. Cl. 285—99 **7 Claims**



A union joint for two tubes has an annular packing member for each tube end and threadably engageable union parts fitted around the packing members for tightening the joint. The packing members each have an inwardly directed lip which extends beyond the tube end prior to tightening and an internal annular slit converging towards the tube end. Metal rings in each slit have rubber-covered flat portions extending in front of each tube end. When tightened, the lips are pressed against one another and are located adjacent the flat portions of the rings.

3,625,551
COUPLING FOR TUBULAR MEMBERS
Donald L. Branton, Delavan, and Hugh W. Sittig, Walworth, both of Wis., assignors to Sta-Rite Industries, Inc., Delavan, Wis.
Filed Feb. 25, 1970, Ser. No. 14,079
Int. Cl. F16l *37/00*
U.S. Cl. 285—305 **4 Claims**

A pipe connector assembly for connecting tubular members together and including a female connector and a

cooperating male connector. A spring retainer is mounted on the female connector and includes an arm that is biased inwardly within a slot formed in the female connector and is

arranged to engage a groove in the male connector when the male connector has fully penetrated the female connector. An O-ring seal is incorporated in the assembly to produce a fluidtight pipe connection between the connectors.

3,625,552

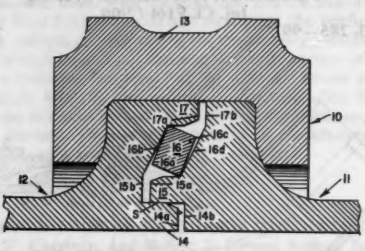
COUPLING SEAL

George A. Mahoff, and Leonard L. Rice, both of 1654 Lincoln Blvd., Santa Monica, Calif.

Continuation-in-part of application Ser. No. 33,437, June 2, 1960, now abandoned , Continuation of application Ser. No. 572,617, Aug. 15, 1966, now abandoned , which is a continuation of application Ser. No. 33,437, Aug. 15, 1966, now abandoned. This application May 5, 1969, Ser. No. 856,866

Int. Cl. F16l *17/00*

U.S. Cl. 285—336 **22 Claims**



A coupling assembly for first and second tubular fluid conducting members is provided. The first and second members include respectively first and second annular stepped portions axially overlapping and radially spaced. An annular metallic seal of resilient material of suitable polygonal cross section, preferably quadrilateral and symmetrical about a midplane normal to its axis in the absence of any loading thereon, is interposed axially and radially between the first and second stepped portions. When the members are urged axially towards each other, the seal is under compression and radially loaded only at a pair of diagonally opposite corner edges thereof to thereby provide high-unit pressure annular substantially line contact sealing between these edges and the members.

3,625,553

DEVICES FOR PIVOTALLY CONNECTING MEMBERS

Luciano Mattioli, Brunoy, France, assignor to D.F.A.S. a.r.l. Diffusion Fabrications Automobiles, Paris, France

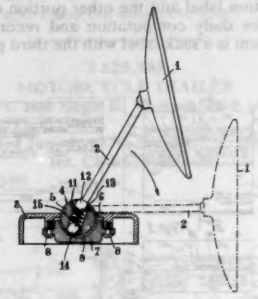
Filed June 30, 1970, Ser. No. 51,108

Claims priority, application France, July 3, 1969, 6922471

Int. Cl. F16c *11/06*

U.S. Cl. 287—21 **2 Claims**

A device for interconnecting a first member carrying a rearview mirror and a second member, for example, the wing of a vehicle, comprises a ball and socket connection and resilient means for urging the ball against a surface of the



socket for resisting relative movement between the ball and the socket.

3,625,554

DEVICE FOR RAPID FIXING OF A TOOL TO THE END OF A ROTATING SHAFT

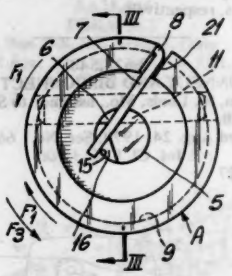
Jean Oliver Louis Mottais, and Jean-Pierre Yves Maratray, both of Loire Atlantique, France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France

Filed Feb. 27, 1970, Ser. No. 14,979

Claims priority, application France, Mar. 5, 1969, 6906052

Int. Cl. F16d *1/06*

U.S. Cl. 287—52.05 **5 Claims**



The invention is concerned with a device for the rapid fixing and releasing of a tool such as a countersink to the end of a rotating shaft. In accordance with the invention the tool has a transverse bore having an internal projection. A resilient device is provided within the bore and the shaft has a facet on which the resilient device can bear.

3,625,555

SPLIT NUT FOR HOUSEHOLD APPLIANCES

Robert J. Scott, Blue Springs, Mo., and Leo F. Aberer, Shawnee Mission, Kans., assignors to Rival Manufacturing Company, Kansas City, Mo.

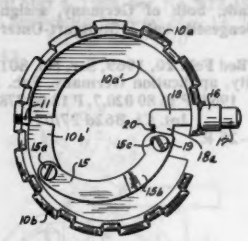
Filed Oct. 24, 1969, Ser. No. 869,203

Int. Cl. F16d *1/00*

U.S. Cl. 287—111 **4 Claims**

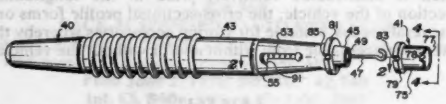
A split nut for household products such as electrically operated blenders has two 180° halves which are hingedly connected at one end and releasably connected at the other. The externally ribbed halves are threaded for connection with the blender base and permits same to be fixedly at-

tached to the blender power unit. An annular lipped structure below the threads cooperates with the releasable con-



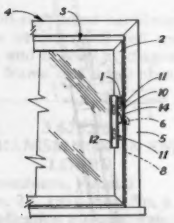
nection to facilitate in an easy removal of the split nut from the blender base.

3,625,556
LOOPER
Henry K. Stromberg, 377 Lloyd St., Cary, Ill.
Filed Oct. 9, 1969, Ser. No. 865,140
Int. Cl. D03j 3/00
U.S. Cl. 289—17 6 Claims



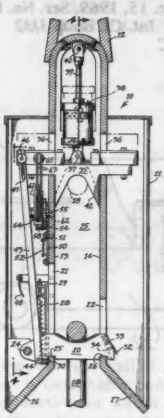
A tool for tying loops and knots, particularly useful in tying small loops or short leaders to small fish hooks and fishing flies.

3,625,557
LATCH UNIT FOR SLIDING-TYPE DOORS
Jack H. Jensen, Danville, Calif., assignor to Rylock Company, Ltd., Union City, Calif.
Filed June 8, 1970, Ser. No. 44,424
Int. Cl. E05c 19/12
U.S. Cl. 292—128 1 Claim



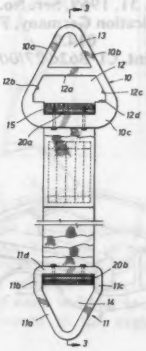
A latch unit, to secure a sliding-type door to the door frame, comprising a rotatably mounted hook on a stile of the door and adapted by inside finger-lever manipulation for movement between a retracted unlatched position and an advanced latched position projecting in downwardly opening relation through a vertical slot in the adjacent doorframe jamb and engaging over the lip at the lower end of such slot; the hook being an integral part of a finger-lever operated rotary plate, such plate being camlike and having a pair of edges of predetermined position and configuration, and a leaf spring peripherally engaging the rotary plate, said spring yieldably bearing on one such edge to maintain the hook in retracted position and yieldably bearing on the other edge to maintain the hook in advanced position while spring-urging said hook downwardly against said lip to prevent escape therefrom upon the door being vertically jounced from the outside.

3,625,558
AUTOMATIC HOIST COUPLING DEVICE
George F. Johnson, Potters Trailer Court, Waverly, Tenn.
Filed Nov. 10, 1970, Ser. No. 88,282
Int. Cl. B66c 1/34
U.S. Cl. 294—83 R 9 Claims



An automatic coupling device for attachment to a hoist line, having a throat passage for receiving the bail of an article, such as a concrete bucket; a pivoted throat latch in the throat passage yieldable to the upper movement of the bail, and adapted to support the bail for hoisting; a yoke member and actuating mechanism for automatically opening the throat latch when actuated by the bail.

3,625,559
LIFTING SLING
Myrtle E. Lawrence, Houston, Tex., assignor to The Lawrence M. Company, Houston, Tex.
Filed Aug. 13, 1970, Ser. No. 63,364
Int. Cl. B66c 1/18
U.S. Cl. 294—74 16 Claims



The sling comprises two end members of rigid material, such as steel, between which is connected an elongated strip of fabric, such as nylon webbing. The end members have openings though which the elongated strip is looped to connect the end members to the strip. A relatively short strip of the fabric material extends through the openings in each end member and is positioned between the elongated load-carrying strip and the end member. The short strips are clamped to the end members to keep them from shifting laterally with respect to the end member and bunching up at one side of the opening. The elongated load-carrying strip is stitched to

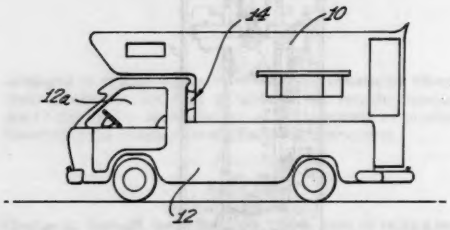
the relatively short strips to thereby anchor it against a tendency for for such lateral movement and bunching up when under load.

3,625,560

BOOT FOR CAMPER-TRUCK COMBINATION

Robert M. Bjork, 10901 Topeka Drive, Northridge, Calif.

Filed Dec. 15, 1969, Ser. No. 885,068
Int. Cl. B60p *3/32*
U.S. Cl. 296—23 MC **5 Claims**



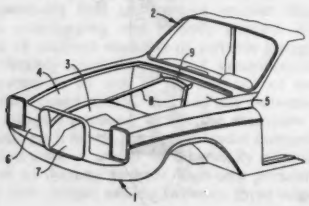
The invention provides a removable flexible plastic tubular member, or boot, for intercoupling the rear window aperture of a truck cab with the front facing window aperture of a camper carried by the truck, so as to afford communication between the truck and the camper. The boot assembly of the invention has an advantage in that it is capable of being coupled securely to the rim of the truck window aperture in a watertight, airtight, and dusttight joint, and yet it can be easily removed. Moreover, the boot assembly of the invention may be installed quickly and easily without the need for tools of any type, and the installation does not require holes in the truck body, or any alteration whatsoever thereto.

3,625,561

REINFORCING ELEMENTS FOR A MOTOR VEHICLE BODY

Guntram Huber, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Jan. 31, 1969, Ser. No. 795,662
Claims priority, application Germany, Feb. 1, 1968, P 16 80 014.9
Int. Cl. B62d *27/00*
U.S. Cl. 296—28 **21 Claims**



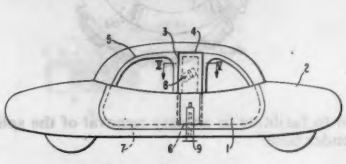
Reinforcing structure for the front body portion of a motor vehicle with a front engine, especially of a passenger motor vehicle, in which reinforcing elements lead from the structural elements disposed on the side of the engine to the cross-connection arranged to the rear of the engine; the reinforcing elements are so constructed and/or arranged and/or secured that they are able to transmit pressure forces only up to a predetermined limit.

3,625,562

CENTER SUPPORT COLUMN FOR MOTOR VEHICLES ROOFS

Bela Barenyi, Stuttgart-Valhingen, and Karl Wilfert, Gerlingen-Waldstadt, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Stuttgart-Unterturkheim, Germany

Filed Feb. 20, 1969, Ser. No. 801,038
Claims priority, application Germany, Feb. 23, 1968, Oct. 3, 1968; P 16 80 020.7, P 18 00 778.8
Int. Cl. B62d *27/02*
U.S. Cl. 296—28 R **38 Claims**



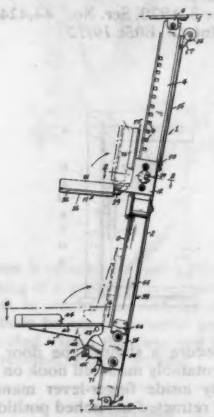
A center support column for motor vehicle roofs in which a hollow cross-sectional profile is provided within the connecting areas of the roof bearers and longitudinal bearers which is constructed relatively wide in the longitudinal direction of the vehicle; the cross-sectional profile forms one or several spaces, suitable for storing accessories whereby the spaces are accessible from within and/or without the vehicle.

3,625,563

TANK COMMANDER'S SEAT AND FOOT PLATFORM ASSEMBLY

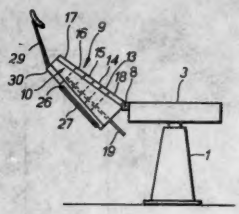
Nonnie F. Dickinson, Aberdeen, and Albert H. Tucker, Baltimore, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed May 22, 1970, Ser. No. 40,292
Int. Cl. A47c *1/02*
U.S. Cl. 297—333 **8 Claims**



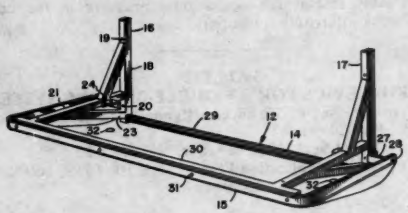
A combined seat and foot platform assembly to be mounted in the turret of a military tank or like vehicle and consisting of a substantially I-beam column secured between the floor and roof of the tank's turret. Spring loaded seat and foot platform assemblies are slidable along the column and are quickly adjustable in selected positions release levers which engage notches in the column. The seat and foot platform are quickly released for emergency descent from an open hatch to a combat position in the turret.

3,625,564
TREATMENT CHAIR
Harald Holstad, Bragerness Torv 2a, 3000 Drammen, Norway
Filed May 5, 1969, Ser. No. 822,350
Claims priority, application Norway, May 14, 1968, 1878/68
Int. Cl. A47c *1/10*
U.S. Cl. 297—353 2 Claims



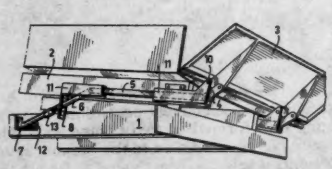
Chair for medical or dental treatments, having the back divided into a plurality of adjustable sections with means for maintaining a spacing between the sections and guides for controlling the motion of same, the length of the back being adjustable.

3,625,565
BACK-SUSPENDED CANTILEVER SEAT
Chester J. Barecki, Grand Rapids, Mich., assignor to American Seating Company, Grand Rapids, Mich.
Filed June 2, 1970, Ser. No. 42,740
Int. Cl. B60n *1/00*; A47c *5/00*, *7/00*
U.S. Cl. 297—450 7 Claims



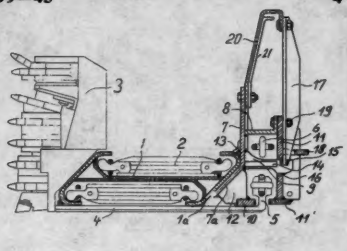
A longitudinal wall-supported cantilever seat has vertical posts anchored to a vehicle wall and seat-supporting arms carried by the posts and braced by diagonal struts, the arms supporting a tubular frame carrying a plastic shell seat.

3,625,566
TURNING MECHANISM FOR AN ENDBOARD OF A LORRY
Teuvo Suuronen, Lievestuore, Finland
Filed Jan. 27, 1970, Ser. No. 6,114
Claims priority, application Finland, Feb. 1, 1969, 3133/68
Int. Cl. B60p *1/26*
U.S. Cl. 298—23 D 2 Claims



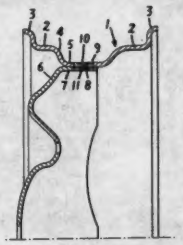
A turning mechanism for an endboard of a lorry comprising an operating arm displaced by means of the tilting movement of the platform of the lorry for turning of the endboard.

3,625,567
MINING MACHINE LONGWALL GUIDE STRUCTURE
Gunter Blumenthal, Westerholt; Heinz Kunzer, Herne/Westphalia, and Klaus Spies, Dortmund-Wellinghofen, all of Germany, assignors to Klockner-Werke Aktiengesellschaft, Duisburg, Germany
Filed Dec. 3, 1969, Ser. No. 881,760
Claims priority, application Germany, Dec. 4, 1968, P 18 12 552.5
Int. Cl. E21c *35/12*
U.S. Cl. 299—43 4 Claims



In a mining machine, the rear wall of each channel section of a scraper conveyor is detachably connected with a casing member of a casing section in which a chain driving the chain connectors of the cutter support of a cutting apparatus is located. The guide rail for the chain connectors is fixedly secured to the casing member and forms a rigid unit with the same on which other casing parts can be supported.

3,625,568
METHOD OF MAKING DISK WHEEL
Henri Verdier, Puy-de-Dome, France, assignor to Compagnie Generale Des Etablissements Michelin raison sociale Michelin & Cie, Clermont-Ferrand, Puy-de-Dome, France
Filed July 1, 1969, Ser. No. 838,116
Claims priority, application France, July 2, 1968, 157608
Int. Cl. B60b *1/06*
U.S. Cl. 301—63 R 8 Claims

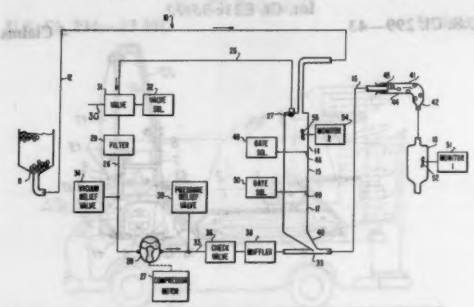


A disk and a rim are assembled to form a wheel and are joined by welding spots. Punches or milling tools are simultaneously applied to opposite sides of the disk and rim and pressed together with sufficient force to form a permanent impression adjacent to each welding spot. This established a compressive reinforcement in the region of each welding spot.

3,625,569
PNEUMATIC CONVEYOR
Sheldon Little, Atlanta, and Orval L. Braunbeck, Jonesboro, both of Ga., assignors to Sheldon Little Company, Atlanta, Ga.
Filed Feb. 19, 1970, Ser. No. 12,570
Int. Cl. B65g *53/00*
U.S. Cl. 302—2 R 8 Claims

A pneumatic conveyor for moving bottle caps or crowns from a large storage bin to a bottle-capping apparatus in a bottling line. An airflow stream is created from the crown

storage bin to carry crowns to and fill a first accumulation chamber, the flow stream is terminated, the crowns in the first accumulation chamber are transferred to a second accumulation chamber, and the flow stream from the storage bin to the first accumulation chamber is reestablished. A continuous airstream is maintained from the second accumulation chamber to the supply hopper of a crown dispenser in a bottling line and the crowns intermittently accumulated in



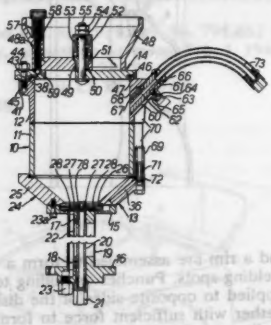
the second accumulation chamber are transported in the continuous airstream to the supply hopper. A major portion of the airstream is separated from the crowns as the crowns approach the supply hopper so as to decelerate the crowns as they approach the supply hopper. The intermittent operation of the airstream between the crown storage bin and the first accumulation chamber functions in response to the quantity of crowns present in the supply hopper for crown dispenser.

3,625,570

APPARATUS FOR DISPENSING WORKPIECES

Dennis Ford, Birmingham, England, assignor to Concentric Production Research Limited

Filed Sept. 24, 1969, Ser. No. 860,754
Claims priority, application Great Britain, Sept. 24, 1968, 45,253/68
Int. Cl. B65g *53/00*
U.S. Cl. 302—2 **10 Claims**



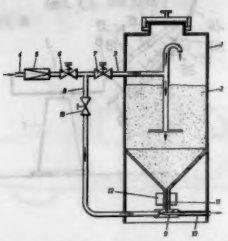
Apparatus for dispensing workpieces comprises a chamber incorporating opposed end closure assemblies one of which is provided with means for introducing into the chamber through a series of jet orifices air under pressure. Outlet means are located in the chamber at a point remote from the said one end closure assembly, and the chamber is provided with at least one normally closed opening through which workpieces are introduced into the chamber. Air issuing from the jet orifices creates a turbulence within the chamber which causes the workpieces to be directed away from the said one closure assembly and to be discharged individually at random through the outlet means under the influence of air escaping therethrough.

3,625,571

POWDER-DISTRIBUTING APPARATUS

Dieter Kimm, Frankfurt am Main, Germany, assignor to Messer Griesheim G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 22, 1969, Ser. No. 859,799
Claims priority, application Germany, Sept. 25, 1968, P 17 77 217.7
Int. Cl. B65g *53/42*
U.S. Cl. 302—53 **2 Claims**



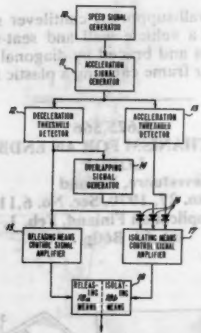
Apparatus for distributing a magnetizable metallic powder, such as iron powder, comprising an airtight container for storing the powder therein, conduit means supplying a pressurized gas to the container for creating a predetermined operational pressure therein, an injector having an inlet operatively coupled with said container and produces a gas-powder mixture from the powder upon forcing the powder into it by the pressure, a magnetic coil disposed adjacent the inlet for preventing, when actuated, entry of the powder into the inlet from the container under pressure thereby reliably sealing the outlet of the container, a valve disposed in the conduit for reliably sealing the container, when closed, whereby actuation of the magnetic device and closing of the valve reliably retains the operational pressure in the container during interruption of operation.

3,625,572

ANTISKID DEVICE FOR A VEHICLE-BRAKING SYSTEM

Guy Marouby, Neuilly, France, assignor to Societe Anonyme D.B.A., Paris, France

Filed Sept. 17, 1969, Ser. No. 858,662
Claims priority, application France, Oct. 10, 1968, 169427
Int. Cl. B60t *8/04*
U.S. Cl. 303—21 BE **1 Claim**



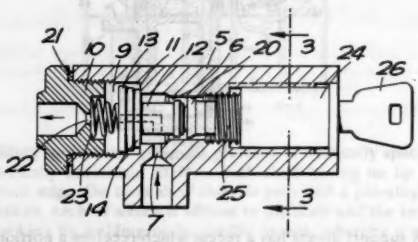
An antiskid device for a vehicle-braking system having an electronic sensing unit selectively controlling the operation of an actuating unit formed of two components. Once the braking pressure has been applied to the braking system, one of the components is selectively activated to isolate the brake pedal from the braking system between one instant corresponding to a predetermined threshold of wheel deceleration and another instant substantially corresponding to the end of the wheel acceleration period which follows the wheel deceleration period while the other component is selectively

activated to progressively release the pressure in the braking system to a certain value between said one instant corresponding to said predetermined threshold of wheel deceleration and still another instant corresponding to a second predetermined threshold of wheel deceleration which is closed to the point of zero deceleration (or acceleration), the pressure in the isolated braking system being maintained to the said value until the instant substantially corresponding to the end of the wheel acceleration period which follows the wheel deceleration period, i.e. until the moment where the brake foot pedal may become again operative and may generate, due to the deceleration of the wheel, a succeeding operating cycle.

3,625,573
ANTITHIEF DEVICES

Jack Samuel Conn, Walton-on-Thames, England, assignor to Auto-Safe Limited, Richmond, Surrey, England

Filed Nov. 19, 1969, Ser. No. 878,071
Int. Cl. B60t *17/16*
U.S. Cl. 303—89 **10 Claims**

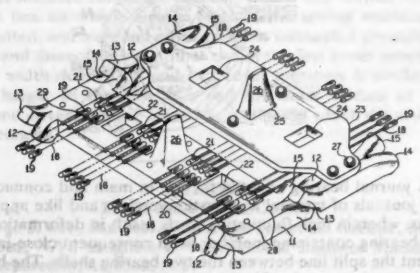


In a hydraulic brake system of a vehicle having a master cylinder and brake cylinders, between the master cylinder and the brake cylinders, a device for preventing the unauthorized movement of the vehicle comprising essentially a device operable to act as a one-way valve to prevent return flow of brake fluid from the brake cylinders to the master cylinder, the one-way valve having a valve head of plastics material and including a pressure relief valve comprising a valve member spring urged against an aperture in said plastics valve head to permit passage of excess fluid from the brake cylinders to the master cylinder.

3,625,574
TRACK ELEMENT FOR SELF-LAYING TRACK-TYPE VEHICLE

Dominic Plastino, Montreal, Quebec, Canada, assignor to Pac-Trac Industries Limited, Ottawa, Ontario, Canada

Filed Sept. 15, 1969, Ser. No. 857,667
Claims priority, application Canada, July 14, 1969, 056,997
Int. Cl. B62d *55/18*
U.S. Cl. 305—40 **9 Claims**

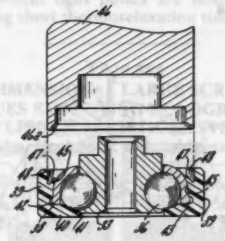


A track for a track laying vehicle in which the individual track elements are joined together by a series of separate wire rope connectors which fit into recesses in the track element and are held in place by a bolted cover plate. Each track element has a pair of cams at each of four corners. One of the cams of each pair being curved upwardly and the other being curved downwardly such that rotational movement of one track element relative to the adjacent track element results in at least one cam one of one track element rolling on the surface of a cam on the adjacent track element.

3,625,575
ANTIFRICTION ROLLER

Lee T. Darnell, Rockford, Ill., assignor to Amerock Corporation, Rockford, Ill.

Filed Aug. 8, 1969, Ser. No. 848,563
Int. Cl. F16c *21/00*
U.S. Cl. 308—3.8 **9 Claims**

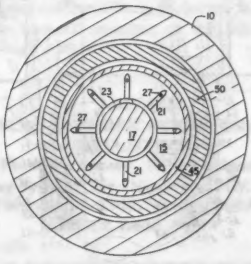


An antifriction roller for use in a drawer slide. The roller is formed by a generally cylindrical inner race, a plurality of balls seated in the inner race, an outer race telescoped over the balls and the inner race, and a cup-shaped nylon tire formed with a bottom wall and a sidewall telescoped over the outer race. A radially outwardly extending shoulder is formed around the periphery of the outer race and is seated in an annular groove in the tire with a snap fit to held hold the tire on the outer race. To reduce the tendency of the tire to separate axially from the outer race, a lip is formed on the sidewall of the tire and bears against the outer race. The lip is formed from the material of the sidewall after the tire has been telescoped over the outer race. To accomplish this, a circular die is pressed against the inner portion of the end of the sidewall to deform the material of the inner portion of the sidewall and mold the deformed material in a cold operation into the lip. The lip is formed between the outer die and the outer race thus causing one surface of the lip to engage the outer surface of the outer race and to assume the shape of the outer surface of the outer race.

3,625,576
BEARING AND SEALING STRUCTURE FOR HIGH-SPEED SHAFTS

Kenneth H. Miller, Syracuse, N.Y., and Robert N. Zuck, Glendora, Calif., assignors to Carrier Corporation, Syracuse, N.Y.

Filed Apr. 15, 1970, Ser. No. 28,899
Int. Cl. F16c *17/10, 33/72*
U.S. Cl. 308—9 **2 Claims**



A bearing in which the shaft is journaled is fixed in a housing and has a radial portion formed with a series of radially

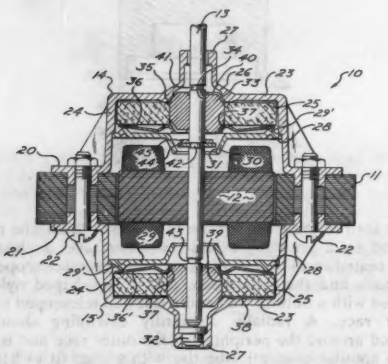
disposed grooves extending outwardly from the shaft and terminating short of the periphery of the radial portion. The radial portion of the bearing is formed with a passage extending from the outer end of each groove to an oil drain chamber. A thrust disc or collar is fixed to the shaft and has running engagement with the surface of the radial portion of the bearing and has a cylindrical flange encircling the same. A seal is provided intermediate the housing and the flange to prevent or reduce to a minimum the escape of oil from within the housing.

3,625,577

LUBRICANT-RETAINING MEANS

Howard R. Coleman, Elyria, Ohio, assignor to The General Industries Company, Elyria, Ohio

Filed Jan. 19, 1970, Ser. No. 3,873
Int. Cl. F16c *33/78*
U.S. Cl. 308—36.4 **2 Claims**



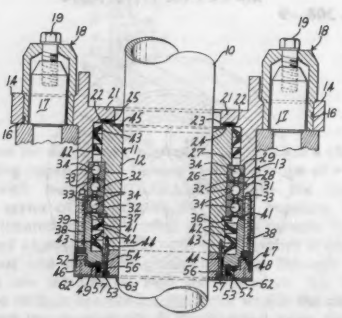
There is disclosed herein a small electric motor having a rotor shaft rotatably mounted adjacent to the ends thereof in self-aligning bearings disposed within lubricant reservoirs and surrounded by lubricating wicks. The rotor shaft has circumferential grooves adjacent to the ends of the bearings surrounded by frustoconical openings. A retainer ring and washer combination is associated with one of said grooves.

3,625,578

GUIDE BUSHING FOR ROTARY DRILL PIPE

James B. Loftis, Remlap; David L. Moody, and James H. Phillips, both of Oneonta, all of Ala., assignors to Robbins Machinery Company

Filed Oct. 12, 1970, Ser. No. 79,857
Int. Cl. F16c *33/72*
U.S. Cl. 308—187.1 **9 Claims**



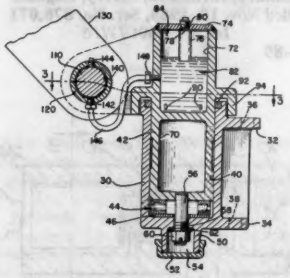
Guide bushing assembly having cylindrical member with hardened inner surface of dimension to engage and rotate with drill pipe and permit relative axial movement. Cylindrical member supported by lubricated bearing assembly between cylindrical member and outer housing. Flexible lubricant seals limit egress of lubricant and ingress of foreign materials. Cover on cylindrical member nearest hole being bored extends alongside adjacent end of housing with ring seal in oppositely disposed recesses therebetween. Resilient O-ring in one recess urges ring seal toward other recess.

3,625,579

BEARING STRUCTURE

Einar O. Lunde, 66 Calypso Shores, Novato, Calif.

Filed Mar. 23, 1970, Ser. No. 21,722
Int. Cl. F16c *19/10*
U.S. Cl. 308—227 **8 Claims**



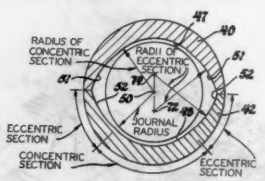
A support means has a recess which receives a portion of a rotatable means. A thrust bearing and a cushion pad support the lower end of the rotatable means, and a well is provided in communication with the bottom of the recess. A lubricant reservoir is provided in the upper part of the rotatable means and has lubricant therein as well as air in the upper part thereof. A pivot pin is supported by the rotatable means and a flexible conduit connects the lubricant reservoir with a groove formed in the interior of a sleeve journaled on the pivot pin. Means is provided for filling the lubricant reservoir and for venting the groove in said sleeve when filling the groove with lubricant.

3,625,580

JOURNAL BEARING FOR FLUCTUATING LOADS

Arnold O. DeHart, Rochester, Mich., and Duane H. Harwick, Kettering, Ohio, assignors to General Motors Corporation, Detroit, Mich.

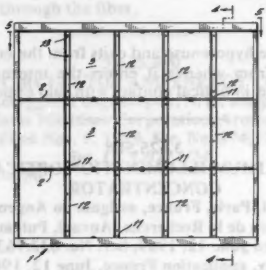
Filed Feb. 19, 1970, Ser. No. 12,716
Int. Cl. F16c *3/14*
U.S. Cl. 308—240 **4 Claims**



A journal bearing adapted for use in main and connecting rod journals of internal combustion engines and like applications, wherein high-fluctuating loads result in deformation of the bearing containing member, with consequent close-in adjacent the split line between the two bearing shells. The bearing comprises a pair of bearing shells, preferably including a central concentric section having an inner surface centered on the bearing axis and connecting with eccentric end sections providing for progressively increasing clearance from the associated journal adjacent the bearing split line. The ec-

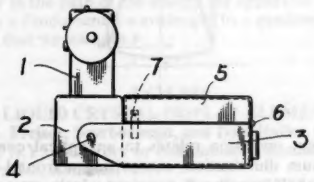
centric end sections extend sufficiently far from the split line to prevent bearing distress due to close-in. High-load capacity and low-oil flow requirements are attained by the use of a relatively large concentric central section.

3,625,581
COMPACT OFFICE FILING CABINET
Philip Frederick, Brooklyn, N.Y., assignor to Supreme Equipment & Systems Corp.
Filed Oct. 6, 1969, Ser. No. 864,071
Int. Cl. A47b *53/00*
U.S. Cl. 312—198 **6 Claims**



A filing cabinet comprising a plurality of vertically spaced, substantially horizontal shelves, each shelf having no lip on the front edge. On each shelf there is provided a plurality of separators, each of which is affixed to the shelf and the vertical backing by welding or by similar means, whereby a stiff substantially rigid structure is obtained without the necessity of the lip on the front edge.

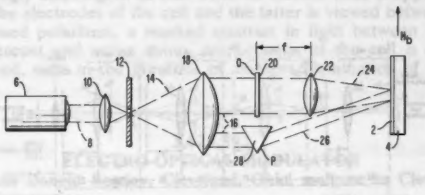
3,625,582
CASE FOR A PORTABLE SEWING MACHINE
Hajime Naito, Kofu, Japan, assignor to Crystal Sewing Machine Ind. Co., Ltd., Tokyo, Japan
Filed Dec. 2, 1969, Ser. No. 881,382
Int. Cl. A47b *21/00, 85/00*
U.S. Cl. 312—208 **1 Claim**



A case for a portable sewing machine comprising a first cover member connected pivotally at one end thereof with a base box on which a main body of the sewing machine is mounted, and a second cover member connected pivotally at one end thereof with the other end of the first cover member. The width defined by said two cover members is similar to the height of the base box and the outer surface of the second cover member is used as a table on which the sewing is operated.

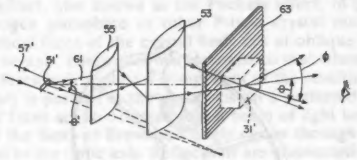
3,625,583
ERASABLE HOLOGRAM
George J. Fan, San Jose, Calif., and James H. Greiner, Millwood, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed July 15, 1968, Ser. No. 745,034
Int. Cl. G02b *27/00;* **G02f** *1/22*
U.S. Cl. 350—3.5 **3 Claims**

A hologram is produced that is erasable. The erasable storage medium is a thin layer of a europium chalcogenide, i.e., europium oxide, on which the hologram is recorded. The medium chosen on which to record a hologram is erasable and shows no degradation for repetitive storage and erasures.



A powerful laser beam is employed for recording purposes in that short powerful light pulses are needed to record on materials having short thermorelaxation times.

3,625,584
THREE DIMENSIONAL LARGE SCREEN MOVIE TECHNIQUES EMPLOYING HOLOGRAPHY AND A CYLINDRICAL OPTICAL SYSTEM
Daniel S. St. John, Hockessin, Del., assignor to Holotron Corporation
Filed Jan. 9, 1970, Ser. No. 1,603
Int. Cl. G02b *27/00;* **G03b** *35/00, 41/00*
U.S. Cl. 350—3.5 **25 Claims**

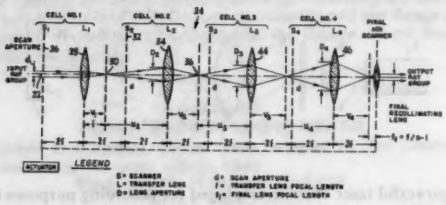


Holographic information-processing techniques which result in a hologram being formed on photosensitive material capable of reconstructing an image in real space many times the size of the hologram. Horizontal and vertical information components of an object scene to be holographically recorded are treated independently of each other. The horizontal informational component is reduced by an optical system and recorded across a long dimension of a rectangular hologram. In a preferred form of the invention, the horizontal informational component is dispersed prior to holographic recordation in order to reduce the bandwidth of said information. Except for the possible use of light-gathering optics, the vertical informational component of an object scene to be recorded along the narrow dimension of the hologram is not processed. Successive holograms so constructed are placed on a film and drawn across their narrow direction through a shutterless continuous wave coherent light beam to reconstruct in real space successive images that appear to a theater audience to form continuous action. The horizontal information component is displayed in full three dimensions while the vertical information is projected with limited three dimensionality to each member of the audience from the hologram through a lenticular screen.

3,625,585
PERIODIC SCAN MAGNIFICATION FOR LASER BEAM DEFLECTION
Leo Beiser, Flushing Manor, N.Y., assignor to Columbia Broadcasting Systems, Inc., New York, N.Y.
Filed Aug. 5, 1968, Ser. No. 750,086
Int. Cl. G02b *23/00*
U.S. Cl. 350—54 **16 Claims**

Periodic scan enhancement takes advantage of iteration or summation of contributions from individual scanning sections. Vignetting at the scanning aperture is avoided, permitting employment of a multiplicity of elements whose sizes

are diffraction limited. This is achieved by the interposition of alternate optical transfer elements that reimage the aperture of one scanning element upon the aperture of the next.



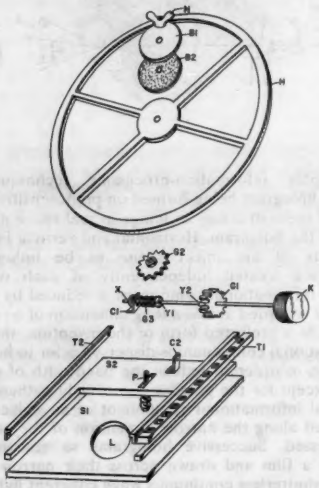
The necessary progressive increase in aperture size occurs at the (static) transfer optics rather than at the (dynamic) scanning elements.

3,625,586

LINEARLY AND ROTATIONALLY ADJUSTABLE MULTISLIDE MICROSCOPE STAGE

Michael T. Olexa, P.O. Box 3080 Sabraton Station, Morgantown, Va.

Filed Aug. 20, 1969, Ser. No. 851,647
Int. Cl. G02b *21/24*
U.S. Cl. 350—90 **1 Claim**



This invention comprises a multiple slide-carrying microscope stage, having integral mechanical means for the reproducible linear and rotational motion of the specimens thereon.

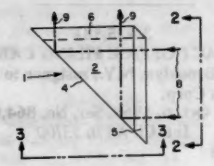
3,625,587

VERSATILE COUPLER FOR INTERNAL REFLECTION SPECTROMETRY

Nicolas J. Harrick, Croton Dam Road, Ossining, N.Y.

Filed Sept. 22, 1969, Ser. No. 859,686
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 **10 Claims**

A versatile coupler for optically coupling a beam of radiation into or out of an internal reflection element for internal reflection spectroscopy is described. The coupler comprises a generally right-triangular member which is optically transparent and two of whose sides are bevelled but in opposite directions. In use, the vertically oriented beam enters at one side of the triangular coupler, internally reflects off its major surfaces and the hypotenuse and exits from the coupler at the opposite side from whence it enters the internal reflection element which is in optical contact with said opposite side.

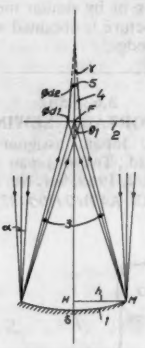


3,625,588

MAXIMUM ILLUMINATION OPTICAL CONCENTRATOR

Pierre Malifaud, Paris, France, assignor to Angence Nationale de Valorisation de la Recherche (Anvar), Puteaux, France

Filed June 12, 1969, Ser. No. 832,763
Claims priority, application France, June 12, 1968, 154666
Int. Cl. G02b *5/16*
U.S. Cl. 350—96 B **3 Claims**



The present invention relates to an optical concentrator with maximum illumination, comprising a frontal parabolic mirror with half opening θ_1 (angle made by a straight line connecting the focus and the mirror edge with reference to the optical axis) effecting a first concentration of a flux captured from a distant source of radiation, forming an image in the smallest section of a bundle of convergent rays with half angle opening θ_1 with the optical axis, and a truncated cone mirror whose entrance section of diameter d_1 is disposed to coincide with the so-called Gaussian image furnished by the said frontal parabolic mirror, and whose terminal section, of smaller diameter, is associated with a sensitive element or radiation transformer of a receiver.

3,625,589

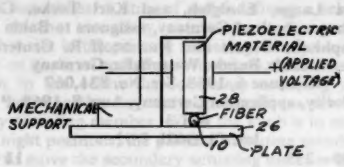
APPARATUS FOR CONTROLLING THE PROPAGATION CHARACTERISTICS OF COHERENT LIGHT WITHIN AN OPTICAL FIBER

Elias Snitzer, Sturbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Aug. 19, 1969, Ser. No. 852,977
Int. Cl. G02b *5/14*
U.S. Cl. 350—96 WG **21 Claims**

A device useful in processing information comprising an

optical fiber for transmitting coherent light in a low-order mode of propagation, means for controlling characteristics,



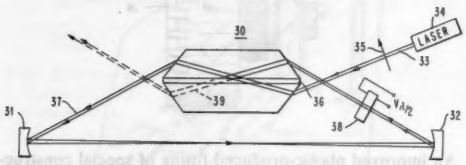
including polarity and phase, of the coherent light as it is transmitting through the fiber.

3,625,590

OPTICAL CIRCULATOR AND ENERGY CONVERTER

Millard A. Habegger, Poughkeepsie, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 5, 1969, Ser. No. 874,171
Int. Cl. G02f 1/24
U.S. Cl. 350—150 **10 Claims**



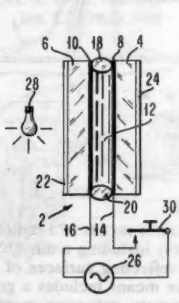
Optical circulator or storage ring apparatus employing a nonreciprocal optical device and reflecting means to store optical energy. The device has the property that if a light beam is projected to it in one direction it is totally reflected and if projected to it in a second direction it is totally transmitted. By employing this device, optical energy may be coupled into and out of the circulator without optical loss. By exercising control over the polarization of the energy the circulator converts it so that it may be supplied in either continuous wave or pulse form. If a nonlinear crystal is located in the circulator in the path of the energy the apparatus acts to convert from a fundamental wavelength to a predetermined harmonic of that wavelength.

3,625,591

LIQUID CRYSTAL DISPLAY ELEMENT

Marvin J. Freiser, Scarborough, and Ivan Haller, Chappaqua, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 10, 1969, Ser. No. 875,235
Int. Cl. G02f 1/26
U.S. Cl. 350—150 **4 Claims**



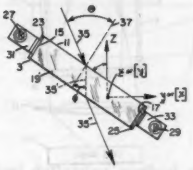
An electro-optical display device employing a cell comprising a nematic liquid between two glass plates whose inner surfaces have been coated with transparent electrodes. Such coated electrodes are rubbed with a cloth or filter paper so that the liquid crystal film becomes oriented along the direction of rubbing. Such film will be homogeneous and strongly birefringent so that when an electric field is applied to the electrodes of the cell and the latter is viewed between crossed polarizers, a marked contrast in light between the quiescent and active states, respectively, of the cell is observed, even in the presence of ambient illumination of the cell.

3,625,592

ELECTRO-OPTICAL MODULATOR

James Donald Beasley, Cleveland, Ohio, assignor to Clevite Corporation

Filed Nov. 13, 1969, Ser. No. 876,464
Int. Cl. G02f 1/26
U.S. Cl. 350—150 **22 Claims**



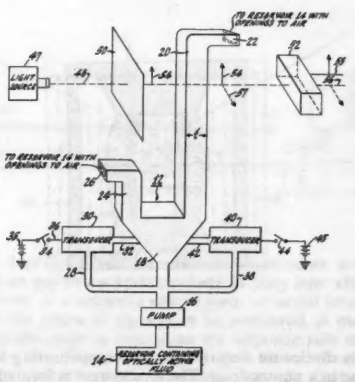
An electro-optical modulator employing the linear electro-optic effect, also known as the Pockels effect, in potassium dihydrogen phosphate or other P-type crystal material has the optical faces of the crystal body cut at oblique angles to the optic axis. Electrodes are arranged so that when a potential difference is applied a component of the resulting field in the body is parallel to the optic axis. In a preferred form the optical faces are so oriented that a beam of light incident on one of the faces at Brewster's angle passes through the body parallel to the optic axis. Reflections are eliminated when the incident beam is linearly polarized with the electric vector parallel to the plane of incidence, and the electric field in the body is zero.

3,625,593

ELECTRICAL CONTROL OF LIGHT POLARIZATION UTILIZING THE OPTICAL PROPERTY OF FLUIDS

George W. Taylor, Princeton, N.J., assignor to RCA Corporation

Filed Feb. 3, 1969, Ser. No. 795,874
Int. Cl. G02b 27/28
U.S. Cl. 350—157 **8 Claims**



The electrical control of light polarization utilizing the optical properties of fluids. A container of fluid is placed in the path of a polarized light beam, and the polarization of the light is changed an amount dependent upon the effective

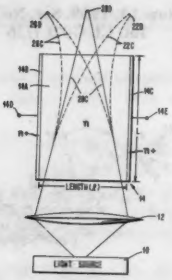
dimensions of the container and the optical characteristics of the fluid. Means responsive to the change in polarization are included for either deflecting, or varying the intensity of, the polarized light.

3,625,594

ELECTRIC FIELD GRADIENT BEAM DEFLECTOR

Conrad Lanza, Putnam Valley, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1969, Ser. No. 837,598
Int. Cl. G02f 1/28
U.S. Cl. 350—160 R 8 Claims



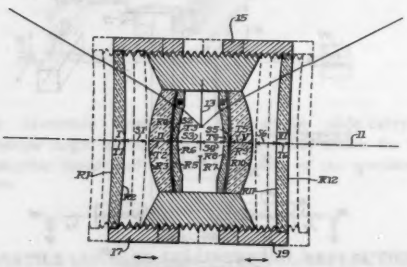
The beam deflector is formed of a body of *n*-type gallium arsenide. Ohmic contacts are made at opposite ends of the body. The doping concentration (n_o) and the length (l) of the body are such that the $n_o l$ product is less than the critical value for inherent bulk oscillations. A voltage above a threshold value applied to the body produces a field gradient across the body. This field gradient produces a gradient in index of refraction for light at energies close to the band gap of the gallium arsenide. The source of light to be deflected is a gallium arsenide injection laser which emits light at less than band gap energy. The laser beam is passed through the gallium arsenide deflector and deflected under the control of voltages applied across the ohmic contacts.

3,625,595

SELF-COMPENSATING SYMMETRICAL LENS SYSTEM

Andor A. Fleischman, Northbrook, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Jan. 26, 1970, Ser. No. 5,487
Int. Cl. G02b 7/04, 9/62
U.S. Cl. 350—215 4 Claims



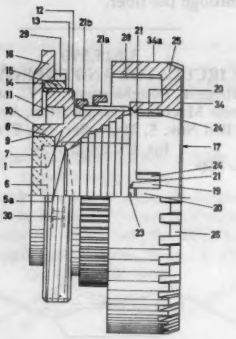
This disclosure describes a self-compensating lens system for use in a photocopier. The lens system is formed of six lens elements axially arrayed along a projection axis. The lenses are symmetrical about a center point. The four inner lenses are essentially fixed in space and the outer two lenses are axially moveable to provide compensation for mechanical and optical variations in the object-to-image distance of the photocopier.

3,625,596

PLASTICS SOCKET ARRANGEMENT FOR OBJECTIVE LENSES WITH DISTANCE ADJUSTMENT FOR CAMERAS

Karl Heinz Lange, Ennigloh, and Karl Tacke, Gohfeld-Bischofshagen, both of Germany, assignors to Balda Werke Photographische Gerate und Kunststoff R. Gruter Kommanditgesellschaft, Bunde, Westphalia, Germany

Filed June 6, 1969, Ser. No. 831,067
Claims priority, application Germany, Aug. 8, 1968, P 17 97 051.3
Int. Cl. G02b 7/02
U.S. Cl. 350—255 11 Claims



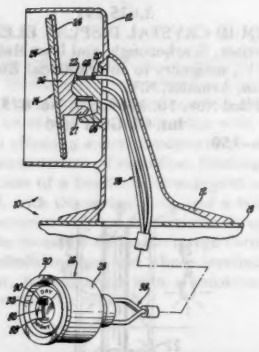
An improved plastic-produced fitting of special construction of objective lenses of cameras with distance adjustment, simplifying the production and avoiding lathe-work, milling, boring a.s.o. but being instantly ready for assembly and a process of mounting and demounting for it.

3,625,597

REMOTELY CONTROLLED DAY-NIGHT MIRROR ASSEMBLY

David P. Jones, Detroit, Mich., assignor to Lee Radke Associates, Inc., Detroit, Mich.

Filed Jan. 12, 1970, Ser. No. 2,252
Int. Cl. G02b 7/18
U.S. Cl. 350—281 17 Claims



An improved actuator means in a remotely controlled day-night mirror assembly including a movably supported mirror means having two reflecting surfaces of different reflecting power. The actuator means includes a generally cup-shaped housing with a primary actuating member supported for universal movement within the housing and a secondary actuating member supported in a semispherical cavity in the primary actuating member for movement relative to the pri-

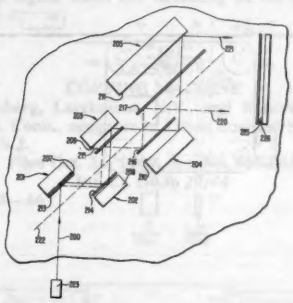
mary actuating member between day and night positions and for moving with the primary actuating member when in either the day or night positions. The secondary actuating member is connected to the mirror by three push-pull remote control assemblies. A strip of metal defining a selector is attached to the secondary actuating member and extends through a slot in the primary actuating member and supports a knob on its distal end. By moving the knob from one end of the slot to the other, the secondary actuating member is moved between the day and night positions relative to the primary actuating member. When the knob is in either of the day or night positions, the primary actuating member may be moved to move the secondary actuating member thereby adjusting the position of the mirror.

3,625,598

LIGHT BEAM DEFLECTOR

Byron R. Brown, San Jose; Kenneth Sanders, Campbell; Lester F. Shew, Los Gatos, and Hans J. Zweig, Mission Viejo, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 9, 1969, Ser. No. 865,088
Int. Cl. G02b *5/08*
U.S. Cl. 350—299 **4 Claims**



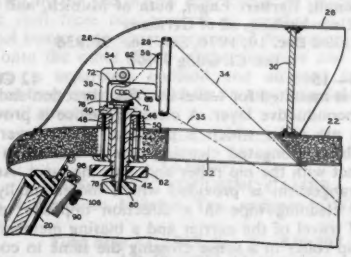
A light beam deflector system comprising parallel positioned movable mirrors, each backed by a fixed mirror, and positioned to deflect an incoming beam back and forth across a central axis. By moving the movable mirrors out of position at a selected station, the beam is permitted to pass on and be deflected by the fixed mirror, which offsets the beam position at the final station. Additionally, if desired, a series of masks may be provided between the target and the last deflecting station which finally aligns the beam with the target. The beam is larger than the size needed, and the mask blanks off the portion of the beam not needed and allows only that portion to pass through which is in direct alignment with the target area.

3,625,599

COMBINED MIRROR AND VISOR

Alfred G. Poirier, P.O. Box 19, Saratoga Springs, N.Y.

Filed Oct. 6, 1970, Ser. No. 78,418
Int. Cl. G02b *5/08*
U.S. Cl. 350—307 **4 Claims**



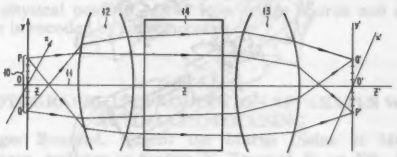
A mirror is mounted above the roof of a vehicle at an aperture, the mirror being adjustable horizontally and vertically by operation of concentric shafts passing through the roof. A visor is provided which cannot block the aperture, the visor including blades which fan out to block or shade the sun at the top of the windshield of the vehicle.

3,625,600

ACOUSTIC LIGHT DEFLECTION METHOD

Stephen Henry Rowe, Los Gatos, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Mar. 31, 1970, Ser. No. 24,263
Int. Cl. G02f *1/16*
U.S. Cl. 350—161 **9 Claims**



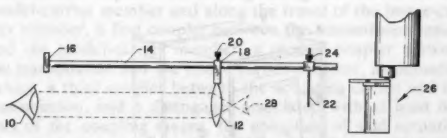
An acousto-optical deflection method employing control of the wave front relationship between the acoustic waves generated in an acoustical Bragg deflector and the optical wave fronts emanating from any one of a number of light sources located along an axis normal to the generated acoustic wave fronts, so that a light beam generated by any one of a number of light sources may be deflected to any one of a desired number of positions without the necessity of adjusting each individual light source position, and without physically moving either the light sources or the acoustical deflector. The system includes in sequence at least one light source, a collimating lens, an acoustical Bragg deflector, and an imaging lens. Applications to data tracking are included.

3,625,601

METHOD AND APPARATUS FOR MEASURING RETINAL DEPRESSIONS AND ELEVATIONS

Peter Augusto, Worcester, and Charles Herman Swope, Holliston, both of Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Feb. 2, 1970, Ser. No. 7,632
Int. Cl. A61b *3/10*; **G01b** *11/30*
U.S. Cl. 351—6 **18 Claims**

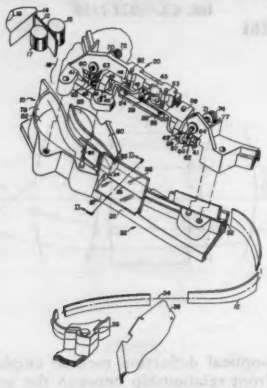


Retinal depression and elevation measurements are obtained with an apparatus which includes a relay lens which is placed in front of a subject's eye to form an aerial image of the area of the retina of the eye to be measured. A marker having a needle point is placed on the opposite side of the lens from the eye. The aerial image is then viewed through a stereoscopic indirect ophthalmoscope, focusing first on a reference plane, the marker needle is moved into focus in the aerial image and then the ophthalmoscope refocuses onto a secondary plane in the image. By moving the marker needle into focus in the secondary plane, the distance of movement of the marker needle determines the relative depression or elevation of the secondary plane.

3,625,602
STRIP FEED GUIDE

Robert P. Grandall, and Ronald A. Phillips, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 20, 1968, Ser. No. 730,484
Int. Cl. G03b *23/12*
U.S. Cl. 353—26 **10 Claims**

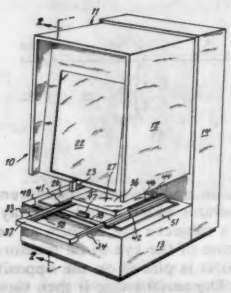


Apparatus is disclosed for receiving a strip of photographic film and for precisely disposing the film with respect to an associated lens and radiation source, which project the images from the strip of film onto a display surface. This apparatus includes a lower guide plate having a V-shaped groove therein and a spring-biased gate having a second V-shaped groove therein between which grooves is driven the strip of film. The spring-biased gate is pivotably mounted about an axis which may be adjusted to coincide with the desired placement of the strip to ensure accurate focusing of the images contained upon the strip of film. More specifically, the gate is disposed upon a hanger by a pair of clips, whose position may be adjusted with respect to the lower guide plate.

3,625,603
MICROFILM READER

Eric G. Jansons, Marietta, Ohio, assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 26, 1969, Ser. No. 827,687
Int. Cl. G03b *23/08*
U.S. Cl. 353—27 **1 Claim**

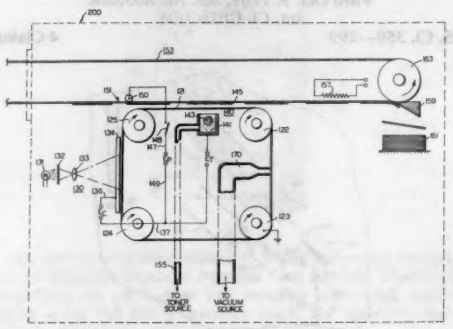


This disclosure describes apparatus for projecting photographic images on a viewing screen. An optical path intersects a plane over which a rectangular transparency holder is randomly traversed. One or more segments of filmed images are arranged in a predetermined manner in the holder, whereby manual or automatic manipulation thereof enables an operator to position a selected image in the optical path. The images, presented in a unitized microform sheet having a common geometrical shape, are readily indexed with respect to known coordinate axes of the sheet. By placing the sheet in the holder in a predetermined manner, the sheet becomes positionable in concert with the holder with respect to the optical path. Accordingly, strips of indicia disposed in orthogonal relationship on the holder and the reader frame, and in mutually parallel relationship with the mentioned coordinate axes provide convenient referencing for image selection.

3,625,604
APERTURE CONTROLLED ELECTROSTATIC PRINTING SYSTEM

Gerald L. Pressman, San Jose, Calif., assignor to Electroprint, Inc.,, Palo Alto, Calif.

Filed Oct. 6, 1967, Ser. No. 673,499
Int. Cl. G03g *5/00, 13/06*
U.S. Cl. 355—3 **11 Claims**



An aperture controlled electrostatic printing device which employs a multilayer screen comprising at least a conductive layer and a superimposed insulative layer to enable the deployment of opposite electrostatic charges on the screen relative to the insulative layer. The double layer charges are modified in accordance with an image to produce blocking and nonblocking fields controlling the apertures in accordance with the image to be reproduced. The conductive screen layer is maintained at a potential usually during charging and printing, and a propulsion field is provided for directing charged printing particles toward the screen. The charged particles pass through the screen where the apertures are not blocked by the fringing fields and also pass through apertures which are partially blocked, but in fewer numbers. This device uses a charge pattern which modulates the flow of toner particles through the screen to a print receiving medium, via preferably an airgap, for subsequent fixing thereon, if necessary.

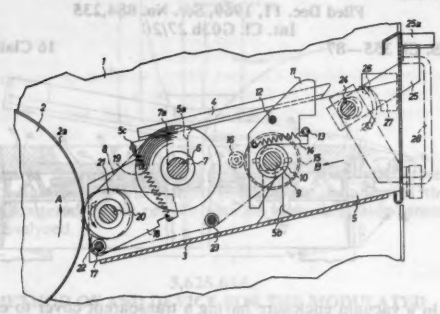
3,625,605
ELECTROSTATIC COPYING APPARATUS

Gunther Schnall; Herbert Engel, both of Munich, and Karl Hartwig, Unterhaching, all of Germany

Filed Dec. 10, 1970, Ser. No. 96,938
Int. Cl. G03g *15/00*
U.S. Cl. 355—15 **12 Claims**

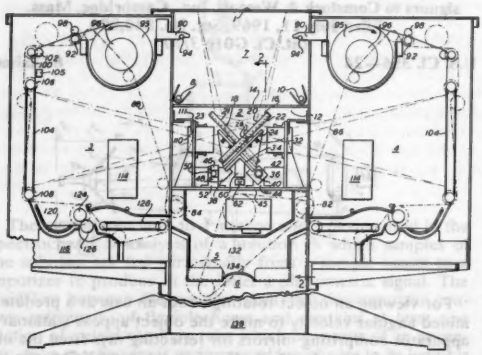
A carrier is mounted for travel in a first direction and carries a photoconductive layer. A cleaning device is provided including a nip roller which is proximal to the layer and about which an elongated cleaning tape is trained in frictional contact with the nip roller and with the layer. An advancing arrangement is provided which incrementally advances the cleaning tape in a direction opposite to the direction of travel of the carrier and a biasing member acts upon the nip roller in a sense crossing the same to contact the photoconductive layer on the carrier when no portion of the cleaning tape intervenes. A detecting arrangement detects and becomes activated when the nip roller contacts the

carrier and consequently begins to rotate in the aforementioned first direction, and a signal-generating arrangement



generates a signal when the detecting device detects such rotation.

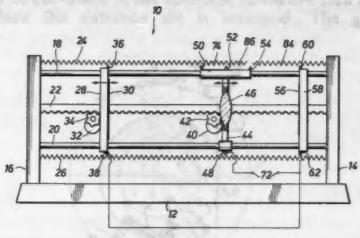
3,625,606
COPYING MACHINE
Paul Rosenberg, Larchmont, N.Y., and Robert F. Stewart, Hartford, Conn., assignors to Litton Business Systems, Inc., Orange, N.J.
Filed Oct. 24, 1969, Ser. No. 869,065
Int. Cl. G03b 27/44
U.S. Cl. 355—46 **5 Claims**



A photocopying machine having dual exposure and developing stations which are alternatively employed to copy an image from a single original. The dual stations are operated by the use of two interconnected movable mirrors which shift from one position to another to project the original image onto one exposure and developing station and then onto the other. Each of the exposure and developing stations is separately encased and adapted for ease in removal from the machine so that it may be quickly replaced in case of a malfunction.

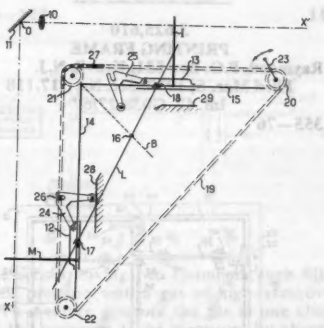
3,625,607
AUTOMATIC FOCUSING CAMERA
Frank R. Bravenec, Houston, Tex., assignor to Warren Childers
Filed May 22, 1969, Ser. No. 826,805
Int. Cl. G03b 27/34
U.S. Cl. 355—56 **11 Claims**

A preferred embodiment of an automatic focusing device for a camera system which gives the necessary magnification. It includes a pair of servo driven self-nulling bridge circuits.



The physical position of the lens, image source and image plane is encoded by slide rheostats.

3,625,608
PHOTOGRAPHIC REPRODUCTION APPARATUS WITH AUTOMATIC FOCUSING
Georges Bouzard, Nogent sur Marne (Seine et Marne), France, assignor to Societe V. Bouzard & ses Fils, Paris, France
Filed July 7, 1969, Ser. No. 839,605
Claims priority, application France, July 12, 1968, 158,931
Int. Cl. G03b 27/36
U.S. Cl. 355—57 **6 Claims**

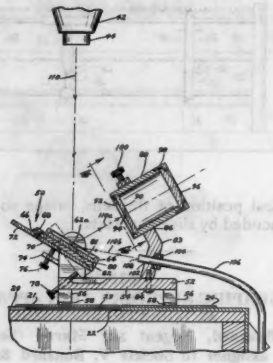


Photographic reproduction apparatus with automatic focusing includes a mobile model-carrier member and a mobile image-carrier member, a rigid pivoted coupling lever continuously coupling said both members together and ensuring accurate focusing irrespective of the scale, and a control device for varying the scale. The control device is a transmission capable of moving along the travel of the model-carrier member and along the travel of the image-carrier member, a first coupler between the transmission means and the model-carrier member, a second coupler between the transmission and the image-carrier member, an actuating device, a third coupler between the actuating device and the transmission, and a disengager associated with at least one part of the coupling means, the operation of said actuating the actuator causes the control device to effect a preferential drive of that of the two members which is the better placed mechanically, taking account of the position of the conjugation lever which drives the other member in its turn.

3,625,609
COMBINED FOCUSING AND PROBE DEVICE FOR PHOTOGRAPHIC ENLARGERS
Roy A. Clapp, Coon Rapids, Minn., assignor to Nord Photo Engineering, Inc., Minneapolis, Minn.
Filed Oct. 13, 1969, Ser. No. 865,860
Int. Cl. G03b 27/74
U.S. Cl. 355—60 **13 Claims**

A mirror is pivotable about an axis spaced a given distance from the plane in which the photosensitive paper is normally

placed. The viewing screen of a focusing magnifier is placed an equivalent distance from the axis and also the light measuring probe aperture is likewise spaced an equivalent



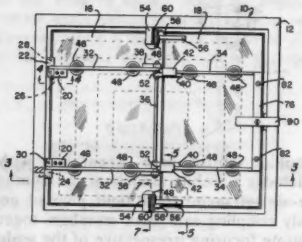
distance from said axis. In this way, any discrepancies attributable to the so-called inverse square law are automatically eliminated.

3,625,610

PRINTING FRAME

Gary E. Raymond, P.O. Box 531, Kenvil, N.J.

Filed Mar. 6, 1970, Ser. No. 17,118
Int. Cl. G03b *27/62*
U.S. Cl. 355—76 **16 Claims**



A printing frame for use in association with a camera for holding copy or photographic materials for camera viewing, has a frame with a transparent glass panel fixed therewithin, and articulated light-transmissive panels pivotally mounted to the frame for disposition upon the transparent panel to secure the copy or photographic material therebetween. The frame has arms pivotally coupled to only one side thereof for carrying the light-transmissive panels. A plurality of springs are secured at spaced-apart locations to, and along, the arms, to constrain the panels together. Components are provided for selectively adjusting the constraint of the springs to facilitate the use of the printing frame with copy or photographic materials of greater or lesser thicknesses.

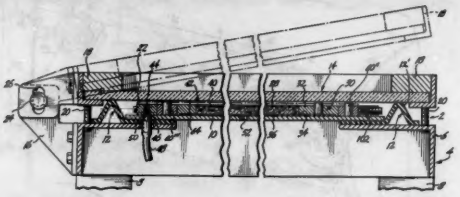
The frame carries fulcrum pieces, at either sides thereof, for engagement with rollers carried by the light-transmissive panels, which pieces and rollers facilitate a removal of the light-transmissive panels from tensioned engagement with the transparent panel, so that copy or photographic materials can be inserted therebetween, and the fulcrum pieces are readily disengageable from the frame, by sliding the same out of engagement with frame-captive hardware, to allow the light-transmissive panels to be fully raised from the transparent panel, so that all said panels can be cleaned.

3,625,611

MASTER REGISTRY CHASE FOR USE IN A VACUUM ENCLOSURE

Alexander L. Orr, and Edward W. Hilton, both of Seattle, Wash., assignors to Renton Engineering Corporation, Kent, Wash.

Filed Dec. 11, 1969, Ser. No. 884,235
Int. Cl. G03b *27/20*
U.S. Cl. 355—87 **16 Claims**



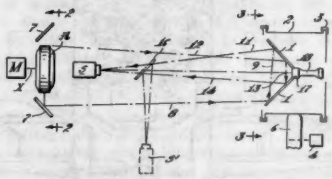
In a vacuum enclosure having a transparent cover to enable the photoimpression of an image on a photosensitive plate therein, there is an open faced marginal frame having a stiff, hard-surfaced platen supported in free-floating condition and reciprocably guided within the opening thereof, to be applied by the vacuum against the cover, while the plate and an image-producing transparency are compressed therebetween, and indexing means on the marginal frame, in substantially the surface plane of the platen, to fix the positions of the plate and the image-producing transparency in relation to one another, while they are under compression between the platen and the cover.

3,625,612

OPTICAL DEROTATOR EMPLOYING MIRROR PAIRS TO VIEW A ROTATING BODY

John A. Decker, Jr., Concord, Mass.; Martin O. Harwit, Ithaca, N.Y., and Domenico S. Sarcia, Saugus, Mass., assignors to Comstock & Wescott, Inc., Cambridge, Mass.

Filed July 11, 1969, Ser. No. 840,900
Int. Cl. G01p *3/40*
U.S. Cl. 356—24 **8 Claims**



For viewing an object rotating about an axis at a predetermined angular velocity to make the object appear stationary, apparatus comprising mirrors for reflecting rays from the object to a viewing location, the mirrors comprising one or more pairs of reflectors, the reflecting surfaces of each pair including an angle less than 180° for reflecting incident light from one reflector to the other and thence to said location, the angle being equal to 180° divided by an even number, one of the pairs comprising a derotator rotatable in the direction opposite to that of the object, the sum of the absolute values of the angular velocities of all the pairs equaling one-half the absolute value of the angular velocity of the object.

3,625,613

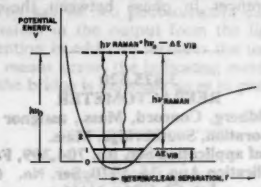
APPARATUS FOR REMOTE SENSING AND ANALYZING OF GASEOUS MATERIALS USING RAMAN RADIATION

Gurdon R. Abell, West Woodstock, Conn., and Charles E. Gillespie, Acton, Mass., assignors to Avco Corporation, Cincinnati, Ohio

Filed June 28, 1968, Ser. No. 741,023
Int. Cl. G01j *3/44*
U.S. Cl. 356—75 **4 Claims**

A turbomachine apparatus disclosed includes a laser transmitter for transmitting a pulsed laser beam for remote

sensing and analyzing of gaseous materials. A receiver including optical means gathers scattered light which is supplied to light beam separating means which provide light



beams at the wave-number of the incident unshifted laser beam light and at the Raman-shifted wave numbers of the light scattered by the remote gaseous materials being sensed and analyzed.

3,625,614

METHOD OF AND DEVICE FOR THE MODULATED SAMPLE SUPPLY IN THE SPECTROCHEMICAL ANALYSIS OF A SOLUTION

Roland Herrmann, Leihgestern; Werner Neu, Reiskirchen; Kurt Rudiger, Giessen; Brigitte Gutsche, Butzbach; Hans Kirchhof, Friedberg, and Werner Trampisch, Giessen, all of Germany, assignors to Carl Zeiss-Stiftung, Heidenheim on the Brenz, Wuerttemberg, Germany

Filed Dec. 18, 1969, Ser. No. 886,098

Claims priority, application Germany, Dec. 20, 1968, P 18 15 958.5

Int. Cl. G01j *3/00*

U.S. Cl. 356—85 **7 Claims**

The invention relates to a method and a device used in the spectrochemical analysis of a solution in which samples of the solution are fed periodically from a sample vessel to a vaporizer to produce in the latter a photometric signal. The fluid line between the sample vessel and the vaporizer consists principally of flexible hoses and contains at least one section of a rigid capillary tube which by means of an eccentric drive mechanism is reciprocated lengthwise to its longitudinally axis to convey individual columns of the sample solution to the vaporizer.

The sample vessel may be divided into a plurality of sections, each containing a different solution and one end of the fluid line may be periodically immersed by the action of said eccentric drive successively into these sections to convey successively a different solution to the vaporizer.

3,625,615

A DEVICE FOR SPECTRAL DISPERSION OF LIGHT EMPLOYING A PREDISPERSION PRISM AND A GRAFTING MONOCHROMATOR

Raymond Wilson, Heidenheim on the Brenz, Germany, assignor to Carl Zeiss-Stiftung, Heidenheim on the Brenz, Wuerttemberg, Germany

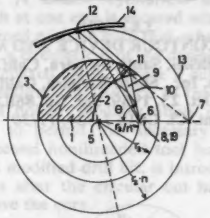
Filed Mar. 30, 1970, Ser. No. 23,571

Claims priority, application Germany, Apr. 1, 1969, P 19 16 548.1

Int. Cl. G01j *3/12*

U.S. Cl. 356—99 **5 Claims**

A device for spectral dispersion of light, comprising a predispersion prism arranged ahead of a grating monochromator and in which the predispersion prism is constructed as an aplanatic prism having spherical faces, one of which is concentric to the first aplanatic point which is spaced from the center of curvature of the aplanatic refractive face and at whose place the entrance slit is arranged. The grating



monochromator is provided with a concave diffraction screen on a Rowland circle on which is disposed not only the second aplanatic point but also the point in which the center ray of a limit beam of a predetermined aperture intersects the second aplanatic circle which is concentric to the center of curvature of the aplanatic refractive face.

3,625,616

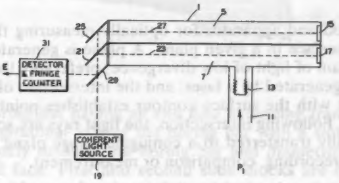
INTERFEROMETRIC PRESSURE SENSOR

Walter W. Lee, Allendale, N.J., assignor to The Bendix Corporation

Filed June 25, 1969, Ser. No. 836,351

Int. Cl. G01b *9/02*

U.S. Cl. 356—107 **11 Claims**



A pressure sensor having two chambers each filled to a predetermined pressure with a gas of high-refractive index and sealed. To measure pressure the gas in one chamber is subjected to the pressures to be measured by changing the volume of the chamber by a bellows. A beam of coherent light is split and passed through the two chambers and then recombined. A fringe counter detects fringe shifts caused by differences in the optical paths due to differences between the measured and predetermined pressures and provides a signal corresponding thereto. To measure differential pressure the gas in both chambers is subjected to the pressures to be measured.

3,625,617

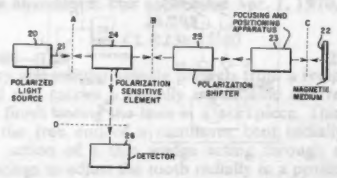
KERR EFFECT READ-OUT SYSTEM FOR AN OPTICAL MEMORY

Di Chen, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed July 15, 1970, Ser. No. 55,045

Int. Cl. G01n *21/44;* **G11b** *11/10*

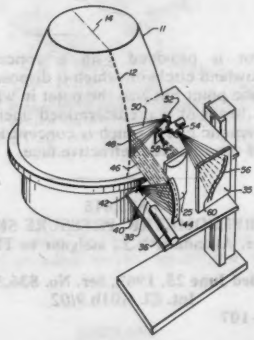
U.S. Cl. 356—118 **7 Claims**



The magnetic state of a material exhibiting the Kerr effect is monitored by a system which directs a polarized light beam

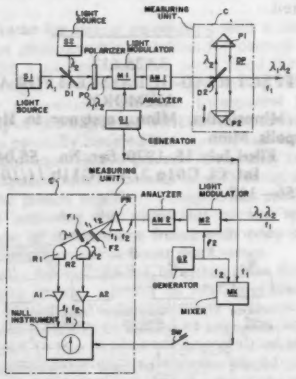
normal to the surface of the material and which includes a polarization sensitive element capable of directing light over two different paths depending on the polarization of the light and a polarization shifter located between the polarization sensitive element and the magnetic material.

3,625,618
OPTICAL CONTOUR DEVICE AND METHOD
Edward Evenden Bickel, Santa Barbara, Calif., assignor to Infrared Industries, Inc., Santa Barbara, Calif.
Filed Oct. 23, 1969, Ser. No. 868,815
Int. Cl. G01b *11/24, 11/30*
U.S. Cl. 356—120 **11 Claims**



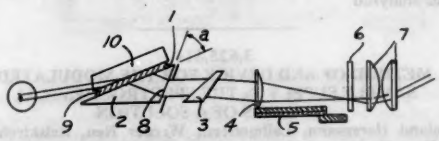
A method and apparatus for optically measuring the contour of a surface in a given plane. A plane is generated by a narrow beam of light of low divergence, preferably the beam of light is generated by a laser, and the intersection of such a scan plane with the surface contour establishes points of intersection. Following intersection, the light rays are scattered and optically transferred to a conjugate image plane for observation, recording, comparison or measurement.

3,625,619
REFRACTION-MEASURING APPARATUS UTILIZING COMMON OPTICAL MODULATOR
Karl Otto Ragnar Scholdstrom, Lidingo, Sweden, assignor to AGA Aktiebolag, Lidingo, Sweden
Filed Mar. 27, 1970, Ser. No. 23,237
Claims priority, application Sweden, Mar. 28, 1969, 4360/69
Int. Cl. G01n *21/46*
U.S. Cl. 356—128 **3 Claims**



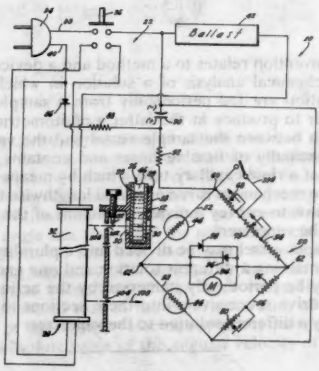
Modulated light containing components of two different wavelengths is transmitted over a path and the modulation phase difference at the receiving end of the path is determined. A common optical modulator is used for demodulating both of the received light components in order to minimize differences in phase between these two components.

3,625,620
REFRACTOMETER
Herbert E. Goldberg, Concord, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Continuation of application Ser. No. 704,309, Feb. 9, 1968. This application Aug. 24, 1970, Ser. No. 66,572
Int. Cl. G01n *21/46*
U.S. Cl. 356—135 **16 Claims**



There is disclosed a critical-angle hand refractometer for measuring the refractive index of an unknown substance by the position of the edge of a shadow (optical image). The refractometer comprises refracting means to linearize the refractometer scale and temperature compensating means which effect a temperature compensation by a rectilinear displacement of the scale or the objective lens of the refractometer without altering the magnification of the optical system of the refractometer.

3,625,621
OPTICAL DENSITOMETER
Louis G. Fields, Los Angeles, Calif., assignor to Calbiochem, Los Angeles, Calif.
Continuation of application Ser. No. 340,943, Jan. 29, 1964, now abandoned. This application July 30, 1969, Ser. No. 849,572
Int. Cl. G01n *21/24*
U.S. Cl. 356—206 **7 Claims**



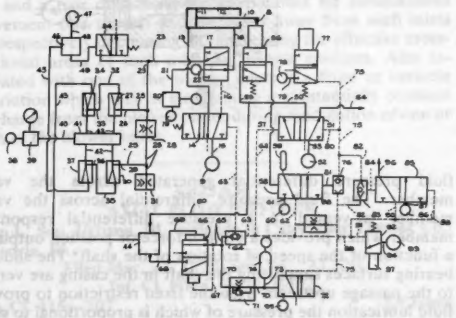
The optical densitometer of the present invention includes a photoresistive element which has a nonlinear relationship between resistance and incident light. A source of light directs light energy through the specimen to be measured and onto the photoresistive element. The intensity of the light from the specimen also varies nonlinearly in accordance with the optical density of the specimen. These nonlinear variations are correlated so that the optical densitometer of the present invention produces an output reading which is directly proportional to the optical density of the specimen which in turn is proportional to the chemical concentration

in the specimen. The present invention also includes the use of a pair of such nonlinear photoresistive cells in a bridge circuit with both cells responsive to a common light source but wherein only one cell is responsive to the light through the specimen. The use of two photoresistive cells compensates for any variation in the output from the light source. The present invention in addition includes the use of diode voltage limiting means across the indicating meter used to determine when the bridge is balanced so as to protect the indicating meter.

3,625,622
SENSING MEANS

Alan T. Wright, 34 Lingfield Avenue, Fordhouses, Wolverhampton, in the County of Stafford, England

Filed Sept. 16, 1969, Ser. No. 858,472
Claims priority, application Great Britain, Sept. 17, 1968, 44,035/68
Int. Cl. B23b *47/24*
U.S. Cl. 408—11 **13 Claims**

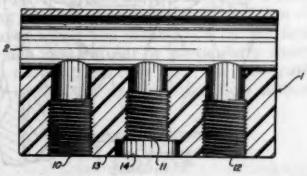


Apparatus for sensing movement of a member by feeding fluid, such as air, displaced as a result of movement of the member, to the control input jet of a fluid logic device so that the fluid logic device switches at a predetermined speed of movement of the member. A drilling apparatus in which the bluntness of the drill is monitored by such a movement sensing apparatus is described. The drilling apparatus also includes means for providing a pecking motion to the drill head.

3,625,623
APPARATUS FOR BORING RADIAL HOLES IN A COAXIAL CABLE

William A. Rheinfelder, Phoenix, Ariz., assignor to RJ Communication Products, Inc.

Filed Feb. 27, 1970, Ser. No. 15,162
Int. Cl. B23b *49/02*
U.S. Cl. 408—97 **3 Claims**

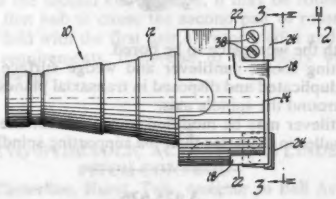


Certain types of couplers utilized in tapping a coaxial cable intermediate along its length require boring a plurality of radial holes in the coaxial cable to closely regulated predetermined depths and without shorting the inner and outer conductors. Tool apparatus for boring such holes is provided and consists of a tool block having a cable-receiving channel disposed across one of its surfaces and a clamp member for securing a coaxial cable in the channel. A plurality of threaded apertures extend from the bottom of the channel through the tool block to the opposite surface. A hollow tubular tool holder is threaded along a portion of its length and provided with a stop shoulder adjacent the thread termination such that it may be introduced into the threaded apertures and screwed down until the shoulder abuts the tool block surface. A hollow cylindrical tool provided with peripheral teeth at one end is secured within the tool holder in a predetermined position such that, when the tool holder is screwed home, a circular cut of the desired depth is directed radially in the coaxial cable. Where a cut through the inner conductor is required, the surface of the tool block against which the tool holder shoulder abuts is undercut to the desired extent to permit the necessary deeper cut. Subsequently, a second nonthreaded tool holder, used in conjunction with a modified drill bit, is introduced into the tool block apertures after the circular cut has been made and twisted to remove the core.

3,625,624
CUTTING ASSEMBLY

Robert Fitzsimmons, Warren, Mich., assignor to Galaxy Wedgebore Corporation, Detroit, Mich.

Filed Jan. 13, 1970, Ser. No. 2,566
Int. Cl. B23b *29/034*
U.S. Cl. 408—116 **15 Claims**



A boring bar having an end face extending transversely to the longitudinal axis of the boring bar with a slot extending completely through the boring bar and diametrically across the end face. First and second slide blocks are disposed in side-by-side overlapping relationship in the slot. The slide blocks have first ends which are disposed in the slot and extend radially in opposite directions outwardly of the boring bar to oppositely disposed second ends. A cutting element is attached to the second end at each of the slide blocks. At least one threaded fastener extends through an elongated slot in each slide block and threadedly engages the bottom of the slot in the boring bar for attaching each slide block to the boring bar and for adjusting the radial position of each slide block independently of the other. The slot in the boring bar is generally T-shaped to define guide grooves and the slide blocks are identical in configuration and include guide flanges disposed in the grooves of the slot. In one embodiment each of the slide blocks includes a gauging recess and a gauge block having gauge ends is attached to the boring bar for radially positioning the slide bars.

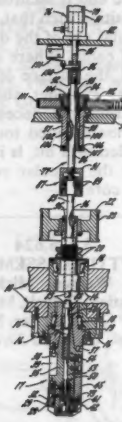
3,625,625
BORING MACHINE WITH CUTTER TOOTH ADJUSTMENT

Jan Van Roojen, and Kenneth M. Hull, both of Rockford, Ill., assignors to The Ingersoll Milling Machine Company, Rockford, Ill.

Continuation-in-part of application Ser. No. 706,254, Feb. 19, 1968, now abandoned. This application Apr. 7, 1970, Ser. No. 26,293
Int. Cl. B23b *39/00*
U.S. Cl. 408—158 **27 Claims**

A rotary and tubular spindle projects from a reciprocatory tool head and carries a radially expandable and retractible tooth for finish boring the hole in a workpiece. This tooth is fixed to the free end of a cantilever bent radially by the camming action of a thin wedge acting through a pair of roller bearings to adjust the tooth radially to a position determined by a stop on the head disposed beyond the other end of the spindle and engageable with a power actuated push

rod extending through the spindle and past the stop. The stop may be adjusted axially in fine increments by a screw and nut actuated by a reversible electric stepping motor which may be activated when adjustment of the finishing tooth is needed to compensate for wear and when the tooth is out of engagement with the workpiece to be bored.



The cutting tooth, cantilever and wedge surface assembly may be duplicated and disposed in transaxial planes angularly spaced around the spindle axis.

The cantilever may be modified to provide for the boring of holes smaller in diameter than the supporting spindle.

3,625,626

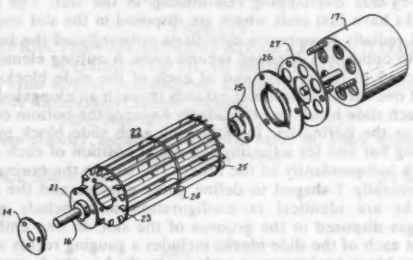
HOUSING AND MOUNT FOR AIR MOVING APPARATUS

Robert W. Lester, 54 George St., Manhasset, N.Y.

Filed Jan. 19, 1970, Ser. No. 399,400

Int. Cl. F04d *5/00*

U.S. Cl. 415—54 3 Claims



A novel improved housing for blowers and method of assembly therefor is made possible by forming a housing which is characterized by its having a uniform cross section, being formed of a single extruded body of aluminum, and being so formed as to receive end plates which can be screwed thereto, the end plates being of a shape to match the semi-involute form of the housing, thereby to make it possible to assemble a housing for a blower consisting of the three pieces, and the method comprising the steps involved in extruding the body stamping the endpieces and assembling the whole.

3,625,627

SPEED TO PRESSURE TRANSDUCER

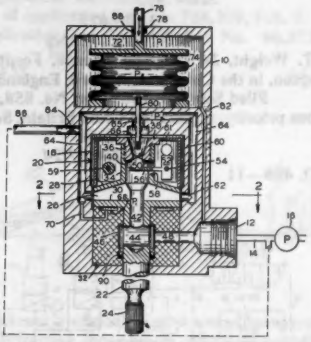
Robert W. Statzell, South Bend, Ind., assignor to The Bendix Corporation

Filed Aug. 3, 1970, Ser. No. 62,223

Int. Cl. F01d *3/02*; G01p *3/26*; F02d *11/08*

U.S. Cl. 415—36 10 Claims

A casing slidably carries a rotatable shaft and is provided with a fluid inlet connected to a source of pressurized fluid. A fluid pump or impeller connected to the shaft and actuated thereby receives fluid from the inlet and discharges the same at a higher pressure as a function of the rotational speed of the shaft to a passage having a fixed restriction and a variable area valve in series flow therein and connecting the pump inlet and outlet. A centrifugal weight rotated by the shaft is connected to the variable area valve to load the same in a closing direction in opposition to a force derived from the fluid pressure differential generated across the valve member. The fluid pressure differential across the valve member is vented to a pressure differential responsive member which provides a control force or position output as a function of the speed of rotation of the shaft. The slidable bearing surfaces supporting the shaft in the casing are vented to the passage upstream from the fixed restriction to provide fluid lubrication the pressure of which is proportional to shaft speed.



3,625,628

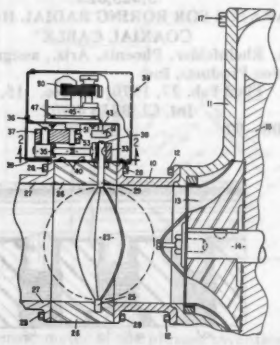
CAPACITY CONTROL OPERATING MECHANISM FOR CENTRIFUGAL COMPRESSOR

Edson H. Byrns, Fayetteville, N.Y., assignor to Carrier Corporation, Syracuse, N.Y.

Filed Aug. 3, 1970, Ser. No. 60,482

Int. Cl. F04d *27/00*

U.S. Cl. 415—150 4 Claims



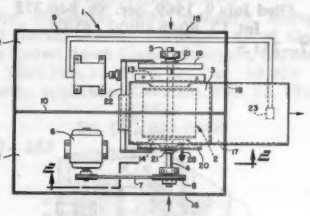
The capacity control means of a centrifugal gas compressor is connected to a reversible motor by motion transmitting means including a crank structure which functions to move the control member slowly as it approaches and leaves closed position. During that portion of the movement of the control member, the torque applied thereto by the motor is multiplied, permitting the use of a small motor.

3,625,629

PROPORTIONAL BLOWER

Thompson Morrison, Shaker Heights; Hunter Morrison, Jr., Pepper Pike, and George F. Knapp, Chagrin Falls, all of Ohio, assignors to M K M Corporation, Chagrin Falls, Ohio

Filed June 4, 1970, Ser. No. 43,318
Int. Cl. F01d 17/14; F24f 7/00
U.S. Cl. 415—157 10 Claims



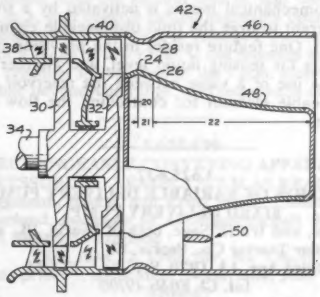
A proportional blower having two inlets and a single outlet, and a pair of damper plates mounted for simultaneous movement one toward and the other away from such inlets for respectively decreasing and increasing the effective cross-sectional areas of such inlets in inverse amounts. Also associated with one of the blower inlets is a fixed or variable restriction which aids in maintaining a substantially constant discharge from the blower outlet during modulation of one or both of the blower inlets.

3,625,630

AXIAL FLOW DIFFUSER

Shao L. Soo, Urbana, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 27, 1970, Ser. No. 23,320
Int. Cl. F04d 19/00, 19/02
U.S. Cl. 415—207 5 Claims



A vaneless diffuser for turbomachinery wherein a pair of spaced-apart walls form three annular diffuser portions along a generally cylindrical downstream flow path. The walls converge together within a diffuser inlet portion, then diverge within a diffuser intermediate portion with a diffuser outlet portion being configured to maintain a condition of imminent boundary layer separation established by the first two portions. Although the diffuser is particularly described with reference to a cylindrical flow path, the flow path may also be generally conical for use in mixed flow turbomachinery, for example.

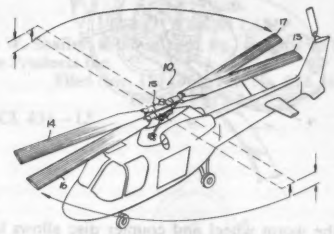
3,625,631

ROTOR HUB AND BLADE FOLDING SYSTEM

Cecil Edward Covington, Jr., Hurst; Wesley Louis Cresap, Fort Worth, and Martin Harrison Lufkin, North Richland Hills, all of Tex., assignors to Bell Aerospace Corporation, Wheatfield, N.Y.

Filed Nov. 3, 1969, Ser. No. 873,351
Int. Cl. B64c 27/10, 27/50
U.S. Cl. 416—1 18 Claims

A system for folding a first pair of rotor blades with a second pair of rotor blades in rotary wing aircraft. Each pair of rotor blades is attached to a separate hub arrangement. The first hub is fixed to the mast for rotation therewith in the normal fashion. A second hub is mounted on the mast and is movable, along splines, up and down the mast from an upper end position to a lower end position. When the second hub is in the upper end position, the second hub is keyed, by virtue of the splines, to the mast for rotation with the mast. Thus, when in the upper end position, the second hub, like the first hub, will rotate with the mast and the rotor blades will rotate



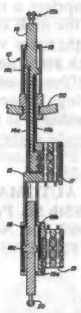
in their normal fashion. However, the second hub may be lowered along the splines to the lower end position. When in the lower end position, the second hub is free to rotate relative to the mast. Thus, when the second hub is moved down the mast to the second end position, it may be rotated relative to the first hub to cause the second pair of rotor blades to align or fold with the first pair of rotor blades and reduce the space requirements, transverse to the rotary wing aircraft, for stowage.

3,625,632

DUAL SERVO HYDRAULIC ACTUATOR CYLINDER FOR PITCH CONTROL

Lesley C. Casterline, Hurst, Tex., assignor to Bell Aerospace Corporation

Filed Oct. 13, 1969, Ser. No. 865,734
Int. Cl. B64c 27/74; F01b 7/20, 15/04
U.S. Cl. 416—98 12 Claims



This invention relates to the mounting of a servo hydraulic actuator for cyclic or collective pitch control of the rotor blades on a helicopter. The actuator is constructed with a cylinder barrel mounted on the frame of the helicopter with a coupling having bearing surfaces shaped to correspond to a portion of a sphere having its center substantially displaced from the coupling toward the pitch horn.

3,625,633

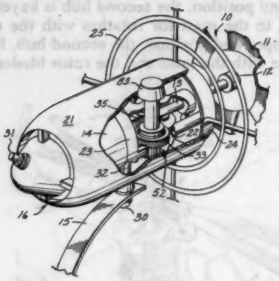
CLUTCH ASSEMBLY FOR COUPLING MECHANISMS

Thomas F. Nelson, Stratford, Conn., assignor to General Electric Company

Filed Sept. 23, 1969, Ser. No. 860,322
Int. Cl. F04d 25/10; F16d 19/00
U.S. Cl. 416—169 11 Claims

A clutch assembly for a coupling mechanism between a constantly rotating driving gear and a gear to be driven. The

assembly includes a worm wheel rotatable about an axle and transversely shiftable with respect to the axle. A coupler disc is provided that is rotatable with the worm wheel. A sloppy

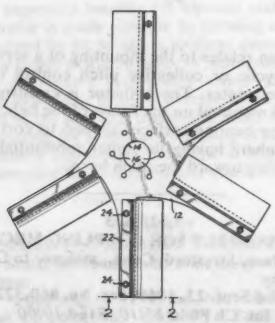


fit between the worm wheel and coupler disc allows lateral movement with respect to each other. The assembly also includes means, such as a movable pressure plate, to engage the coupler disc and the gear to be driven.

3,625,634
TURBOMACHINE ROTOR
Rowland L. Stedfeld, Indianapolis, Ind., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 10, 1969, Ser. No. 883,920
Int. Cl. F01d *5/06, 5/06*
U.S. Cl. 416—198 **1 Claim**

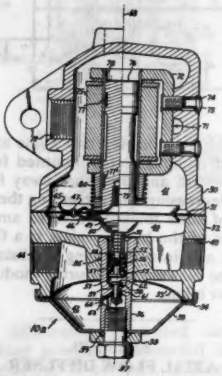
A turbomachine rotor comprises a number of rings forming a drum with end bells at the ends of the drum. Each ring mounts a row of blades with roots which extend through openings in the ring and which are brazed or welded to retain them on the ring. Rings of fibrous composite wrap extend around the blade mounting rings between the rows of blades. The rings may be welded together.

3,625,635
FAN FOR COOLING AUTOMATIC ENGINES
George H. Stonack, 7608 E. 85th St., Puyallup, Wash.
Filed Nov. 20, 1969, Ser. No. 878,409
Int. Cl. F04d *29/34*
U.S. Cl. 416—210 **2 Claims**



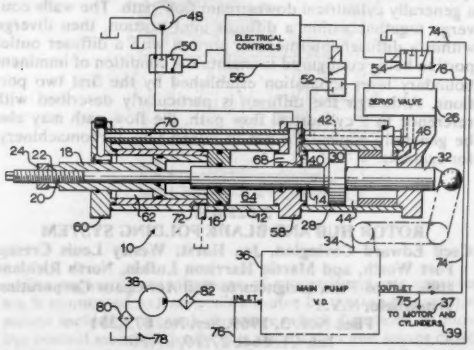
A fan for use particularly in cooling truck engines comprises a hub having a plurality of coplanar outwardly extending arms. A plurality of fan blades are secured one on each arm. Each blade is substantially rigid and uniformly arcuate along its entire length. Securing means secure the hub to the engine. Mounting means detachably mount the blades, one on each arm.

3,625,636
LIQUID LEVEL REGULATING SYSTEM
Robert E. Nelson, Rte. #1, Box 215, Roseamond, Calif.
Filed July 9, 1969, Ser. No. 840,375
Int. Cl. F04b *49/00;, 35/04*
U.S. Cl. 417—211.5 **22 Claims**



A liquid level regulating system according to this disclosure includes a duct having a termination in a container, the liquid level of which is to be regulated. The termination of the duct is normally just below the intended liquid level. A fluid displaceable element is in fluid communication with the duct. Electromechanical means is activated by a source of pulsating current to urge the fluid displaceable element into reciprocation. One feature resides in the provision of a plurality of ducts for sensing liquid level, and another feature resides in the use of a valve between the reservoir and the fluid displaceable element for controlling the flow of fluid therebetween.

3,625,637
CONVERSION OF VARIABLE DELIVERY PUMP TO FIXED DELIVERY PUMP
Jozef Kiwalle, and Ira H. Sage, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 13, 1970, Ser. No. 27,903
Int. Cl. F04b *49/00*
U.S. Cl. 417—218 **5 Claims**



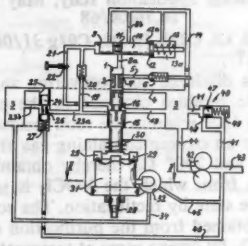
A variable delivery fluid pump and a variable delivery fluid motor are used to accelerate the spindle of an inertia welding

machine to the welding speed, and the pump is then converted to a fixed delivery pump in order to provide a nonfluctuating pressure to power the thrust cylinders for application of the welding pressure.

3,625,638
TIMING AND OUTPUT CONTROL DEVICE FOR FUEL INJECTION PUMPS

Claus Koster, Ditzingen; Heinz Nothdurft, Stuttgart-Degerloch, and Harald Stamm, Gerlingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Feb. 12, 1970, Ser. No. 10,918
Claims priority, application Germany, Feb. 12, 1969, P 19 06 885.0
Int. Cl. F04b *49/00*
U.S. Cl. 417—253 **7 Claims**

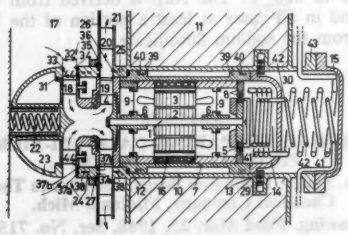


In a fuel injection pump, the delivery of additional fuel quantities required for the starting operation is cut off and the timing of the injection is regulated by the r.p.m.-dependent pressure prevailing in the suction chamber of the fuel injection pump and generated by a feed pump driven by the engine. Said pressure is regulated by a control device disposed in a bypass or return conduit connecting said suction chamber with the suction side of said feed pump. For low r.p.m.'s, said control device maintains open a minimum flow passage section which is enlarged for higher r.p.m.'s. Thus, for a range of low r.p.m.'s, the pressure increase in the suction chamber in response to the r.p.m. increase is significant, while beyond said range, said response is only slight.

3,625,639
INTERCHANGEABLE CONVEYING APPARATUS FOR PRESSURIZED VESSELS SUCH AS REACTORS

Jean Eggmann, Baden, and Ernst Sidler, Fislisbach, both of Switzerland, assignors to Aktiengesellschaft Brown Boveri & Cie, Baden, Switzerland

Filed June 12, 1968, Ser. No. 736,314
Claims priority, application Switzerland, June 22, 1967, 8968/67
Int. Cl. F04d *13/02*; F24b *1/00*
U.S. Cl. 417—360 **9 Claims**

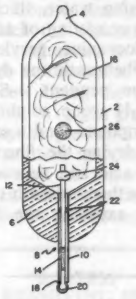


An electric motor driving the impeller of a blower unit located at one end of the motor shaft is insertable in a guide sleeve extending through a wall of a nuclear reactor vessel. As the motor unit is pushed into the guide sleeve, the leading end of the blower unit engages and pushes back a spring loaded cover plate which had sealed the wall opening to prevent loss of pressure from the reactor vessel. When the combined motor and blower unit is withdrawn from the guide sleeve in the wall, the spring loaded cover plate automatically moves back into its sealing position.

3,625,640
PHOTOFLASH LAMP

John W. Shaffer, Williamsport, Pa., assignor to Sylvania Electric Products Inc.

Filed Nov. 19, 1969, Ser. No. 878,164
Int. Cl. F21k *5/02*
U.S. Cl. 431—13 **3 Claims**

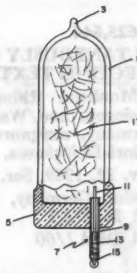


A percussive-type photoflash lamp in which the inner wall of the lamp envelope is provided with an indicator spot containing a fluorescent dye sensitive to the combustion products of the fulminating material of the primer in order to permit automated inspection and rejection of those lamps or subassemblies thereof during manufacture in which the fulminating material has been flashed inadvertently.

3,625,641
PHOTOFLASH LAMP

John W. Shaffer, Williamsport, Pa., assignor to Sylvania Electric Products Inc.

Continuation-in-part of application Ser. No. 670,299, Sept. 25, 1967. This application May 23, 1969, Ser. No. 827,367
Int. Cl. F21k *5/02*
U.S. Cl. 431—93 **2 Claims**



A percussive-type photoflash lamp, the primer of which includes a charge of water-based percussive material.

CHEMICAL

3,625,642

PRINTED TEXTILE FIBERS AND METHOD FOR PRODUCING SAME

Feaster V. Tribble, Rock Hill, S.C., assignor to Martin Marietta Corporation

No Drawing. Filed Aug. 1, 1967, Ser. No. 657,503

Int. Cl. C09b *27/00*

U.S. Cl. 8—27 7 Claims

There are disclosed herein cotton and regenerated cellulose textile fibers having printed thereon a mixture of azoic dye and the dyestuff resulting from reacting Na_2S_{2-4} with certain thiosulfate dyes. There is also disclosed a printing method comprising the steps of applying to cotton or regenerated cellulose textile fibers an alkaline printing paste comprising water, thickener, dyestuff selected from the group consisting of azo, sulfur, phthalocyanine, metal phthalocyanine, perylene, dioxazine, anthraquinone, and isodibenzanthrone dyes having per dye molecule at least one pendant $—SSO_3Na$, $—SSO_3K$, $—SSO_3NH_4$ or $—SSO_3H$ group, solubilized triazene form of stabilized diazo compound, and a solubilized naphthol coupling component; drying the fibers; acid ageing the fibers with volatilized acid and aqueous steam; applying aqueous Na_2S_{2-4} and either soda ash or sodium borax to the fibers; optionally exposing the fibers to air; and washing the fibers.

3,625,643

METHODS FOR PRODUCING SHAPE HOLDING PRODUCTS OF VARIOUS SHAPES FROM SLACK MERCERIZED, STRETCHABLE COTTON FABRICS BY MOLDING THEM

Albert S. Cooper, Jr., Metairie, Albert M. Walker, New Orleans, and William G. Sloan and George F. Ruppenicker, Jr., Metairie, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed Mar. 29, 1963, Ser. No. 269,216

Int. Cl. D06m *13/12, 13/34*

U.S. Cl. 8—116.3 8 Claims

Cellulosic fabrics are subjected to a shrinking treatment such as slack mercerization to impart elasticity thereto and then impregnated with a cross-linking agent; placed on a mold; stretch-molded and heated in the molded configuration to effect cross-linking and set the mold configuration.

3,625,644

PROCESS FOR SIMULTANEOUSLY CLEANING AND DISINFECTING TEXTILE

Heinz Gunter Nosler, Monheim Rhineland, Richard Wessendorf, Essen-Heisingen, and Walter Feldmann, Hilden Rhineland, Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

No Drawing. Filed Nov. 19, 1969, Ser. No. 878,188

Claims priority, application Germany, Dec. 2, 1968, P 18 12 054.2

Int. Cl. D06l *1/00*

U.S. Cl. 8—142 5 Claims

In the process of drycleaning textiles which comprises the steps of immersing soiled textiles in a cleaning liquor based on organic solvents with a low water content for a time sufficient to remove the soil from the textile and recovering cleaned textiles, the improvement which consists adding to said cleaning liquor a condensation product of substantially equimolar amounts of formaldehyde and ethanolamine whereby the textiles are recovered disinfected as well as cleaned. Drycleaning concentrate compositions including the aforesaid condensation product are also part of the invention.

3,625,645

PROCESS FOR THE RECOVERY OF VANADIUM FROM RAW TITANIUM CHLORIDE

Francesco Ferrero and Giuseppe Sironi, Novara, and Angelo Garberi, Cilavegna, Italy, assignors to Montecatini Edison S.p.A., Milan, Italy

Filed May 16, 1969, Ser. No. 825,158

Claims priority, application Italy, May 20, 1968, 16,706A/68

Int. Cl. C22b *59/00;* C01g *31/00*

U.S. Cl. 23—17 8 Claims

A process is disclosed for recovering vanadium from solid $TiCl_4$-free residues obtained in the purification of raw $TiCl_4$ with H_2S, wherein the solid residues are treated with oxygen or an oxygen-containing gas at temperatures between 150° and 200° C., thereby obtaining a $VOCl_3$-containing gas from which the $VOCl_3$ is separated in a practically pure state by rectification. The solid $TiCl_4$-free residues are obtained from the purification sludges of the liquid raw $TiCl_4$ by drying same at temperatures of 150°–180° C., in a stream of inert gas, preferably nitrogen.

3,625,646

PROCESS FOR PRODUCING CRYOLITE

Roland Bachelard, Lyon, France, assignor to Ugine Kuhlmann, Paris, France

No Drawing. Continuation-in-part of application Ser. No. 857,537, Sept. 12, 1969, which is a continuation of abandoned application Ser. No. 701,074, Jan. 29, 1968. This application Dec. 17, 1970, Ser. No. 99,243

Claims priority, application France, Feb. 1, 1967, 93,330

Int. Cl. C01f *7/54*

U.S. Cl. 23—88 7 Claims

A process for producing cryolite, which is essentially free of silica, comprising reacting a mixture of particulate sodium fluosilicate, hydrated aluminum fluoride and a compound producing free gaseous hydrogen fluoride in such proportions that the amounts of NaF and AlF_3 are in stoichiometric proportion to produce cryolite and the free gaseous hydrogen fluriode comprises between about 2 and 10 percent by weight of the total weight of the reactants, the mixture being heated to a temperature of about 500 to 800° C. The NaF is derived from the reactants and in all cases at least a portion of the NaF is derived from the sodium fluosilicate.

3,625,647

METHOD OF PREPARING CALCIUM-NICKEL PHOSPHATE CATALYST

Robert A. Stowe, Ludington, Mich., assignor to The Dow Chemical Company, Midland, Mich.

No Drawing. Filed Mar. 25, 1968, Ser. No. 715,500

Int. Cl. C01b *25/32*

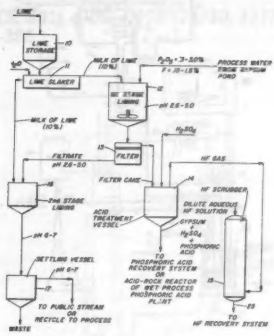
U.S. Cl. 23—105 10 Claims

Calcium-nickel phosphate catalyst is prepared by reacting a calcium hydroxide solution or slurry with a solution containing phosphoric acid and a nickel compound. The pH is maintained at 7–9.

3,625,648
RECOVERY OF FLUORINE AND P_2O_5 FROM DILUTE AQUEOUS ACIDIC PHOSPHATIC SOLUTIONS

Donald Richard Randolph, Lakeland, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Filed Dec. 15, 1969, Ser. No. 884,907
Int. Cl. C01b 25/32
U.S. Cl. 23—109 8 Claims

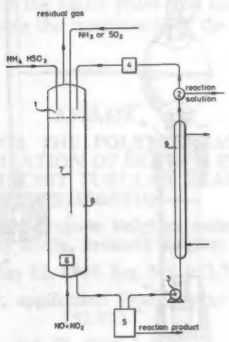


A process is provided for purifying dilute aqueous acidic phosphatic solutions. Fluorine and P_2O_5 values are realuminum and less than about 3% P_2O_5 and 1.5% fluorine, and recovering the P_2O_5 and fluorine values therefrom in a useable form.

3,625,649
PROCESS FOR THE MANUFACTURE OF SULFAMIC ACID

Heinz-Karl Hofmeister, Kelkheim, Taunus, and Rudolf Kohlhass, Frankfurt am Main, Germany, assignor to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 4, 1969, Ser. No. 813,557
Claims priority, application Germany, Apr. 11, 1968, P 17 67 201.4
Int. Cl. C01b 17/00; C01f 11/46
U.S. Cl. 23—166 9 Claims



The invention relates to a process for the manufacture of sulfamic acid from nitrous gases and ammonium sulfite solution at elevated temperature. The starting products are reacted to yield a mixture consisting of the ammonium salts of nitrilotrisulfonic acid, imidodisulfonic acid and sulfamic acid, from which mixture sulfamic acid is obtained by reaction with strong acids.

3,625,650
PREPARATION OF TITANIUM DIOXIDE PIGMENT HAVING THE CRYSTAL STRUCTURE OF ANATASE

John J. Libera, Affton, and Eckard J. Puetz, Lemay, Mo., assignors to NL Industries, Inc., New York, N.Y.

No Drawing. Filed Aug. 27, 1969, Ser. No. 853,479
Int. Cl. C01g 23/04, 23/06, 23/08
U.S. Cl. 23—202 R 2 Claims

This invention relates in general to a process for preparing a high quality titanium dioxide pigment in which the titanium dioxide is in the anatase crystal form. The process comprises hydrolyzing in a particular manner the titanium values from a titanium sulfate-ferrous sulfate solution in which the concentration of titanium is from 80 to 180 g.p.l. calculated as TiO_2 and treating and calcining the hydrate so formed to produce a high grade anatase TiO_2 pigment. Using the hydrolysis process of the instant invention, a high grade anatase titanium dioxide pigment may be produced from a titanium sulfate-ferrous sulfate solution without utilizing the conventional crystallization step for removing most of the iron values nor the concentration step for increasing the titanium content in the liquor to at least 200 g.p.l. TiO_2.

3,625,651
METHOD FOR REMOVING SULFUR DIOXIDE FROM BORON TRIFLUORIDE

Joachim Massonne, Hannover, and Wilfried Becher, Anderten, Germany, assignors to Kali-Chemie Aktiengesellschaft, Hannover, Germany

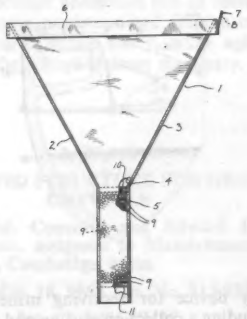
No Drawing. Filed Feb. 24, 1969, Ser. No. 801,742
Claims priority, application Germany, Mar. 9, 1968, P 16 67 582.4
Int. Cl. C01b 9/08
U.S. Cl. 23—205 5 Claims

Sulfur dioxide is removed from boron trifluoride by contact at a temperature between 0° and −80° C. with granular activated carbon.

3,625,652
ANALYSIS OF NARCOTICS AND AMPHETAMINES

James M. Fujimoto, Milwaukee, and Richard I. H. Wang, Elm Grove, Wis., assignors to Marquette School of Medicine, Inc., Milwaukee, Wis.

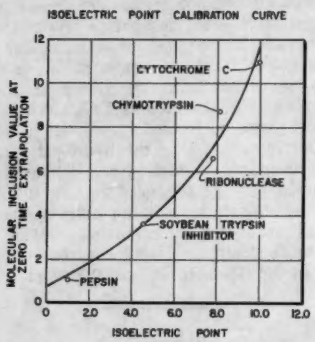
Filed Mar. 17, 1970, Ser. No. 20,346
Int. Cl. G01n 31/06, 33/16
U.S. Cl. 23—230 B 4 Claims



Apparatus and methods for the detection of narcotic analgesics and amphetamines which employ macroretic-

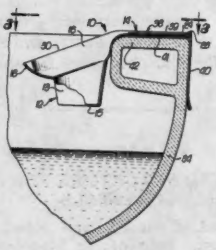
ular heads of styrene-divinylbenzene copolymer to adsorb the narcotic analgesics and amphetamines from human urine in a nonionic mechanism.

3,625,653
DETERMINATION OF THE ISOELECTRIC POINTS OF PROTEINS
Ralph A. Messing, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Filed Apr. 21, 1970, Ser. No. 30,374
Int. Cl. G01n *21/00, 27/28, 27/40*
U.S. Cl. 23—230 R **4 Claims**



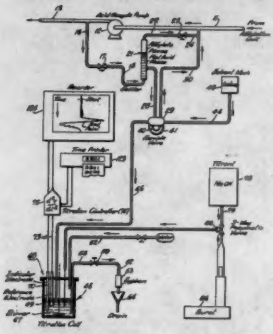
A method for determining the isoelectric points of proteins by placing a dilute aqueous solution of the protein in contact with a porous 96% silica glass membrane. At various time intervals the percent loss of protein from solution to the membrane is calculated. After the second slope of the curve is determined, it is extrapolated to the intercept at time zero. The isoelectric point of the protein is obtained by comparing the intercept to a standard curve.

3,625,654
URINE COLLECTION DEVICE
Charles M. Van Duyne, 235 W. Pueblo St., Santa Barbara, Calif. 93105
Filed May 22, 1970, Ser. No. 39,662
Int. Cl. A47k *11/12;* **A61b** *19/00;* **B01l** *3/00*
U.S. Cl. 23—253 **7 Claims**



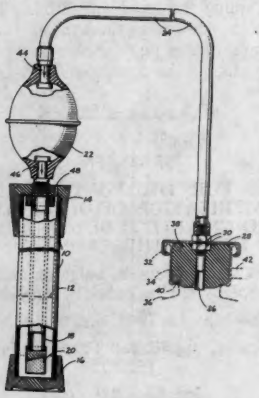
A unitary device for receiving urine specimens for analysis including a collection portion and a handle portion which is adapted to contact the rim of a toilet bowl and wherein said device includes adhesive means for releasably securing said device to a toilet bowl during use.

3,625,655
ACID ANALYZER
Robert A. Culp, Jr., Lafayette, Ind., and Robert E. Franke, Nederland, Tex., assignors to Texaco Inc., New York, N.Y.
Filed Dec. 2, 1969, Ser. No. 881,359
Int. Cl. G01n *27/10;* **C07c** *3/14*
U.S. Cl. 23—253 R **14 Claims**



A system that automatically analyzes acidity or basicity of a chemical process stream periodically. The system can handle a petroleum process stream that contains an acid-hydrocarbon or base-hydrocarbon emulsion. At least some of the hydrocarbons are gaseous under normal ambient conditions. The acid, under system pressure, is settled in a vertical column and subsequently sampled. The acid or basic content of the sample is determined by a potentiometric titration.

3,625,656
GAS LEAK DETECTOR FOR LIQUID-COOLED INTERNAL COMBUSTION ENGINES
John K. Paulson, 14930 SW. Uplands Drive, Lake Oswego, Oreg. 97034
Filed Mar. 28, 1969, Ser. No. 811,404
Int. Cl. G01m *3/20;* **G01n** *31/22*
U.S. Cl. 23—253 R **9 Claims**



A passageway through a radiator cap communicates through an elongated tube and aspirator bulb with a delivery tube opening into a gas indicator fluid confined in a vented transparent container.

3,625,657

APPARATUS FOR CARRYING OUT POLYMERIZATION AND DIMERIZATION REACTION BY MEANS OF AN AMALGAM

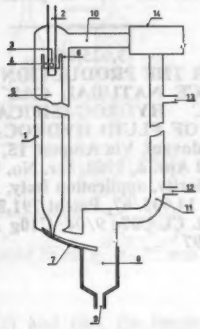
Pierre Mathis, Dombasle-sur-Meurthe, France, and Leon van Melkebeke, Wezembeek-Oppem, Belgium, assignors to Solvay & Cie, Brussels, Belgium

Filed May 29, 1969, Ser. No. 828,946

Claims priority, application Belgium, May 30, 1968, 59,055

Int. Cl. B01j *4/00*; C07c *121/20, 121/28*

U.S. Cl. 23—285 5 Claims



Polymerization and dimerization by means of an amalgam are carried out by circulating a compound to be polymerized or dimerized in a liquid phase in a reactor, circulating the amalgam in the reactor as a continuous film flowing under gravity along a smooth surface and continuously withdrawing a portion of the liquid phase from circulation in a quantity corresponding to the production in the reactor while continuously introducing into circulation, reactants and other components of the liquid phase in amounts which correspond to the quantity withdrawn. The apparatus for carrying out the process includes a closed circuit which contains the reactor. Inside the reactor a substantially smooth vertical or highly inclined surface is provided which supports the flow of a film of amalgam. Means is also provided in the closed circuit for forming the amalgam into a continuous film, flowing down the smooth surface, means for continuously taking a sample of the liquid phase and means for continuously introducing the components of the liquid phase.

3,625,658

APPARATUS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF OLEFINS INCLUDING A CLOSED CIRCUIT TUBULAR REACTOR AND SUPPORT DEVICE THEREFOR

Andre Closon, Brussels, Belgium, assignor to Solvay & Cie, Brussels, Belgium

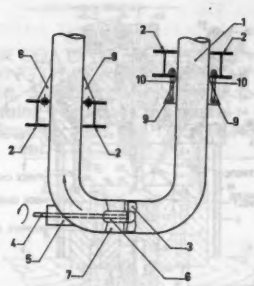
Filed May 12, 1969, Ser. No. 823,765

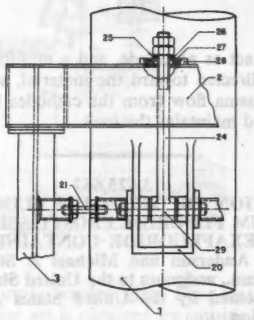
Claims priority, application France, May 14, 1968, 152,123

Int. Cl. C08f *1/98*

U.S. Cl. 23—285 5 Claims

The apparatus for low pressure polymerization includes a closed circuit tubular reactor, a pump to circulate the dispersing medium for the polymerization or copolymerization and a support device for the reactor provided with means for permitting free movement in the plane of the reactor. By providing for free movement in the plane of the reactor, permanent deformations of the reactor assembly, due to heat stress are avoided.





3,625,659

PHOSPHOR RECLAMATION FROM A SLURRY

Michael J. Hammond and Raymond F. Herner, Towanda, Pa., assignors to Sylvania Electric Products Inc.

No Drawing. Filed May 28, 1970, Ser. No. 41,593

Int. Cl. B01d *21/00, 12/00*; C01f *17/00*

U.S. Cl. 23—293 13 Claims

Cathode luminescent phosphors can be reclaimed from a slurry by adding a predetermined amount of a soluble periodate ion source to the slurry, while agitating, and then separating the phosphor from the slurry.

3,625,660

METHOD AND STRUCTURE FOR GROWING CRYSTALS

Thomas B. Reed, Concord, and Edward R. Pollard, Arlington, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

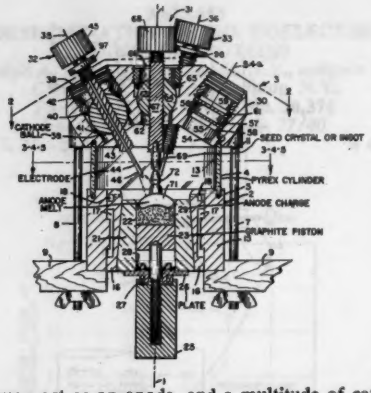
Filed Mar. 18, 1968, Ser. No. 713,955

Int. Cl. B01j *17/18*

U.S. Cl. 23—301 SP 1 Claim

A melt or puddle is formed in a solid material contained in a cold crucible. The solid material acts as a

self-crucible for the melt and crystals are grown at the center of the melt. The melt is formed in the solid material by a multitude of arcs struck between the material



which may act as an anode, and a multitude of cathodes which are directed toward the material, so that the electron and plasma flow from the cathodes to the material, produces and maintains the melt.

3,625,661

SEPARATION OF TITANIUM FLUORIDE AND NIOBIUM FLUORIDE FROM GASEOUS URANIUM HEXAFLUORIDE CONTAINING SAME

Lowell W. Anderson and Michael J. Stephenson, Oak Ridge, Tenn., assignors to the United States of America as represented by the United States Atomic Energy Commission

No Drawing. Filed Aug. 11, 1969, Ser. No. 849,200
Int. Cl. C01g *56/00*
U.S. Cl. 23—337 **3 Claims**

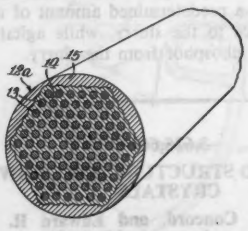
This invention relates to a method of selectively removing titanium or niobium values from a gaseous mixture of uranium hexafluoride and niobium pentafluoride or titanium tetrafluoride by passing the mixture through a bed of pelletized complex fluoride at a temperature in the range of 200° F. to 400° F.

3,625,662

SUPERCONDUCTOR

John A. Roberts, North Chelmsford, and Peter R. Roberts, Groton, Mass., assignors to Brunswick Corporation

Continuation of application Ser. No. 535,222, Mar. 17, 1966. This application May 18, 1970, Ser. No. 38,457
Int. Cl. B21c *37/00*; H01b *5/08*; H01f *7/22*
U.S. Cl. 29—191.6 **13 Claims**



A superconductor formed by the physical or geometrical relationship of two or more materials comprising a composite structure; the superconductive means being located substantially within a matrix. The superconductive means includes elemental materials, solid solution metal alloys, and/or diffusion gradient metals. The matrix comprises at least one non-superconductive metal component.

3,625,663

THERMOSTATIC BIMETAL AND HIGH EXPANDING ALLOY

George A. Majesko, Glen Ridge, N.J., assignor to Wilbur B. Driver Company

No Drawing. Filed Jan. 21, 1969, Ser. No. 792,838
Int. Cl. B32b *15/00*
U.S. Cl. 29—195.5 **2 Claims**

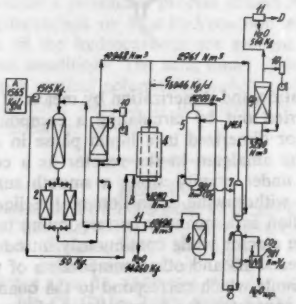
A high expanding component for a thermostatic bimetal in the form of an alloy having as major constituents, nickel, chromium, iron and manganese. A bimetal utilizing this component together with a conventional low expanding component such as Invar can be used within a temperature range of −196° C. to 250° C. without any loss of strength or elasticity since, unlike conventional bimetals, neither of the two components used in my bimetal undergoes any type of phase information.

3,625,664

PROCESS FOR THE PRODUCTION OF RICH FUEL TO REPLACE NATURAL GAS BY MEANS OF CATALYTIC HYDROGASIFICATION UNDER PRESSURE OF FLUID HYDROCARBONS

Carlo Padovani, Via Ampere 15, Milan, Italy

Filed Apr. 4, 1968, Ser. No. 718,860
Claims priority, application Italy, Apr. 5, 1967, 14,605/67, Patent 791,843
Int. Cl. C07c *9/04*; C10g *13/02*
U.S. Cl. 48—197 **11 Claims**



A mixture of methane and hydrogen which is interchangeable with natural gas, is obtained from liquid hydrocarbons by means of a two step catalytic hydrogenation process under pressure. In the first step a complete gasification, but not a complete hydrogenation, is effected by contacting the liquid hydrocarbons with a mild-hydrogenating catalyst in such a controlled condition of temperature, pressure, hydrogen-to-carbon ratio as to obtain a gas containing 10–60% by volume of free hydrogen. In the second step the gas obtained in the first step is practically completely hydrogenated to methane on a catalyst having high hydrogenating and methanating activity. The resultant product is essentially methane with up to 12 volume percent hydrogen.

3,625,665

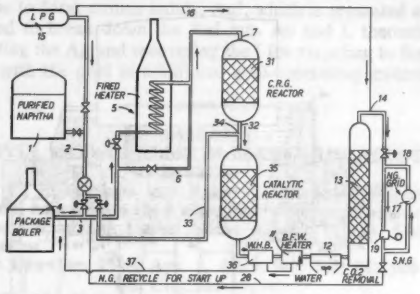
PROCESS FOR THE PRODUCTION OF METHANE CONTAINING GASES

Brian Hoyle Thompson, Solihull, England, assignor to The Gas Council, London, England

Filed Apr. 23, 1969, Ser. No. 818,561
Int. Cl. C07c *9/04*
U.S. Cl. 48—214 **13 Claims**

A process for the production of a gas containing a high proportion of methane (e.g. 90% or more) comprises: (i) introducing a preheated mixture of steam and the vapour of a predominantly paraffinic hydrocarbon feedstock having a final boiling point of not more than 300° C. (e.g. naphtha) into a first catalytic reaction zone

in which the mixture reacts in the presence of a steam reforming catalyst to give a gas containing methane, hydrogen, carbon oxides and undecomposed steam; (ii) cooling the gas produced in stage (i) by adding a further quantity of at least one of the reactants; (iii) introducing the gaseous mixture formed in stage (ii) into a second catalytic reaction zone in which the constituents of the mixture react in the presence of a catalyst to increase the proportion of methane in the mixture; and (iv) removing steam and carbon dioxide from the gas leaving the second catalytic reaction zone. The gas may be used as a synthetic natural gas.



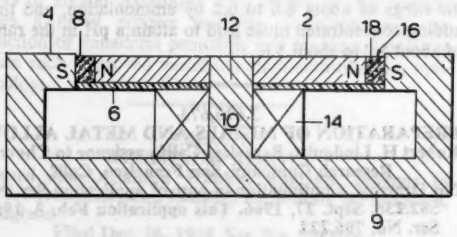
In both stages (i) and (iii) the temperature is kept as low as possible, depending on the catalyst: for example, stage (i) may be operated at a catalyst bed temperature of 400–500° C., and stage (iii) such that the outlet temperature is 200–250° C., when a low temperature steam reforming catalyst is used in both stages. The reaction zone in stage (iii) may be internally cooled, at least at the outlet end of the zone.

The cooling in stage (ii) is preferably achieved by adding cold hydrocarbon feedstock.

3,625,666
METHOD OF FORMING METAL-COATED DIAMOND ABRASIVE WHEELS

George S. James, Johannesburg, Transvaal, Republic of South Africa, assignor to Industrial Distributors (1946) Limited, Johannesburg, Transvaal, Republic of South Africa

Filed June 16, 1969, Ser. No. 833,628
Claims priority, application Republic of South Africa, June 19, 1968, 68/3,910
Int. Cl. B24b *1/00*; B24d *3/02*
U.S. Cl. 51—295 2 Claims

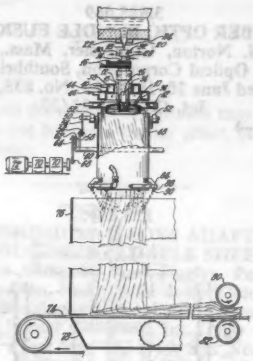


The working zone of an abrasive tool is formed from nickel-coated diamond particles and a runny epoxy resin. The mixture of diamonds and resin are charged into a mould. Settling out of diamond particles is prevented and the distribution of the particles in the runny resin is controlled by applying a magnetic field or an electrostatic field across the mould. The direction of the lines of field force is chosen to be normal to the eventual working face so that elongated particles tend to align themselves axially along lines of force.

3,625,667
METHOD FOR COATING AND FORMING HIGH STRENGTH GLASS FIBER MAT

Richard E. Pitt, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation

Filed June 18, 1969, Ser. No. 834,263
Int. Cl. C03c *25/02*
U.S. Cl. 65—3 3 Claims

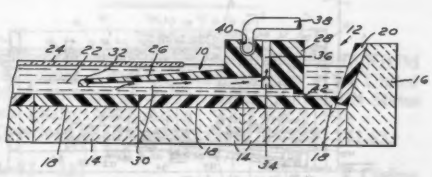


A more uniformly bonded glass fiber mat than produced by the prior art is obtained by causing droplets of binder having a predetermined and generally uniform size to penetrate a gas flow containing the attenuated glass fibers at an angle of convergence of less than approximately 40 degrees. The droplets are unaccompanied by gas flow other than that induced by the droplets. The size of the droplets are such that they are large enough to surround the juncture of abutting fibers but are sufficiently small that they will not penetrate the veil. These droplets are projected at a velocity generally equal to the velocity of the fibers of the veil.

3,625,668
DEVICE FOR TRAPPING AND REMOVING GAS BUBBLES FROM A GLASS MANUFACTURING CHAMBER

Robert J. Greenler, Monroe, Mich, assignor to Ford Motor Company, Dearborn, Mich.

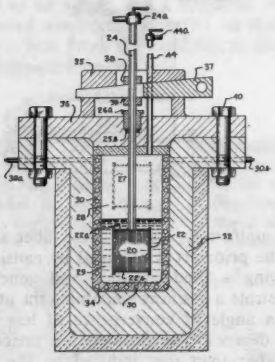
Filed May 15, 1970, Ser. No. 37,794
Int. Cl. C03b *18/02*
U.S. Cl. 65—182 R 9 Claims



A glass manufacturing chamber contains a refractory ceramic lining which supports thereon a molten bath over which glass may be floated to form a ribbon of glass. A device for trapping and removing gas bubbles from the chamber includes a block of material nonreactive with the molten bath and any atmosphere contained within

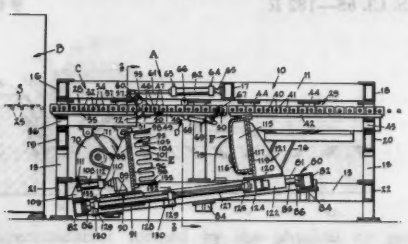
the chamber. The block has a first portion submerged in the molten bath at a position located above a portion of the refractory ceramic lining. The first portion of the block has a plurality of gas receiving pockets formed therein which face the refractory ceramic lining. The block of material also has a second portion to which the first portion is connected. The second portion of the block has gas collecting and gas venting openings formed therein which are interconnected with the gas receiving pockets formed in the first portion of the block. Any gas issuing from the refractory lining is caught by the gas receiving pockets and then vented through the gas collecting and gas venting openings formed in the second portion of the block.

3,625,669
FIBER OPTIC BUNDLE FUSION
Frederick H. Norton, Gloucester, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed June 20, 1969, Ser. No. 835,113
Int. Cl. C03c *23/20*
U.S. Cl. 65—4 **4 Claims**



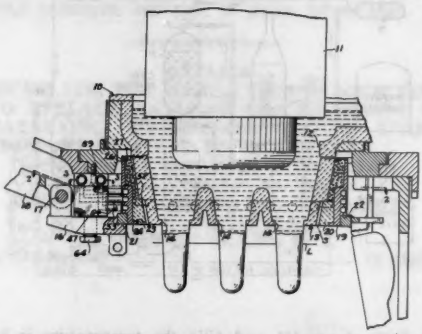
Method and apparatus for making fused image-conducting fiber optic face plates and the like which are impervious to gases and free from gas inclusions and such therein.

3,625,670
GLASS SHEET BENDING METHOD AND APPARATUS
George F. Ritter, Jr., Toledo, Ohio, assignor to Libby-Owens-Ford Company, Toledo, Ohio
Filed Nov. 5, 1969, Ser. No. 874,332
Int. Cl. C03b *23/02*
U.S. Cl. 65—106 **7 Claims**



A method of press bending glass sheets which employs an apparatus including mold members supported for movement toward and away from one another and having complemental, curved shaping surfaces, means for conveying flat glass sheets along a path above said mold members with a pivotal section adapted to locate a glass sheet between the mold members and to remove the same after the bending operation.

3,625,671
APPARATUS FOR FEEDING GLASS HAVING MULTIPLE OUTLETS
Helmut T. Schirm, Toledo, and Robert O. Zeigler, Holland, Ohio, assignors to Owens-Illinois, Inc.
Filed Jan. 6, 1969, Ser. No. 789,136
Int. Cl. C03b *5/26*
U.S. Cl. 65—326 **10 Claims**



An apparatus for feeding glass comprising a forehearth having an opening therein beneath which an orifice ring assembly is movably mounted. The orifice ring assembly comprises an orifice pan in which an insert is positioned that, in turn, supports an orifice ring which has a plurality of orifices through which glass is delivered. The orifice pan and insert have interconnecting passages for selectively supplying and controlling the combustion of gases provided between the periphery of each orifice in the orifice ring and the insert.

3,625,672
METHOD FOR PREPARING AMMONIATED WET PROCESS SUPERPHOSPHORIC ACID BASE SOLUTION
Wendell D. Burch and Donald L. Whitfill, Ponca City, Okla., assignors to Continental Oil Company, Ponca City, Okla.
No Drawing. Filed Feb. 10, 1969, Ser. No. 798,153
Int. Cl. C05b *11/06*
U.S. Cl. 71—35 **1 Claim**

Precipitation of magnesium impurity in fertilizer base solution prepared from wet process superphosphoric acid is reduced by adjusting the pH of the solution to within the range of about 6.0 to 6.2 by ammoniation, and then adding concentrated nitric acid to attain a pH in the range of about 5.0 to about 5.6.

3,625,673
PREPARATION OF METALS AND METAL ALLOYS
Robert H. Lindquist, Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.
No Drawing. Continuation-in-part of application Ser. No. 582,238, Sept. 27, 1966. This application Feb. 3, 1969, Ser. No. 796,222
The portion of the term of the patent subsequent to July 29, 1986, has been disclaimed
Int. Cl. B22f *9/00*
U.S. Cl. 75—.5 **3 Claims**

Process for preparing dispersion-hardened metals and metal alloys, comprising forming a solution comprising metal chloride precursors of the continuous and dispersed

phases of the final product, adding an epoxy compound to said solutions whereby a gel comprising metal hydroxides is formed, converting said metal hydroxides to oxides, and reducing the oxide precursors of the continuous phase of the final product, and products so prepared.

3,625,674
GOLD RECOVERY PROCESS
Albert L. Jacobs, 521 5th Ave., New York, N.Y. 10017
Filed Apr. 10, 1969, Ser. No. 815,113
Int. Cl. C22b *11/04*
U.S. Cl. 75—101 5 Claims

Gold is extracted and isolated from gold-containing materials by reacting the gold with aqueous alcoholic iodine to form aurous iodide, AuI, which is separated and heated to break down the AuI into Au and I, thereafter isolating the Au and recovering the I for recycling to form AuI with the gold in additional gold-containing material.

3,625,675
NOVEL IRON-CHROMIUM-BERYLLIUM ALLOY SYSTEM
Fred C. Robertshaw and Roger J. Perkins, Cincinnati, Ohio, assignors to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Apr. 1, 1969, Ser. No. 812,360
Int. Cl. C22c *39/14*
U.S. Cl. 75—126 2 Claims

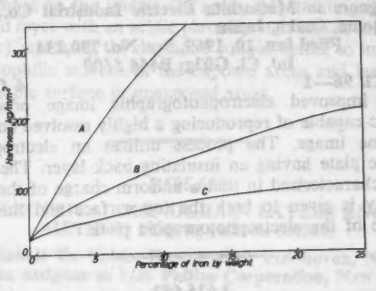
The present invention relates to selected iron-beryllium-chromium alloy systems containing minor additions of at least one strength-inducing additive selected from the group consisting of tungsten, niobium, carbon, and yttrium. These alloys are characterized by high strength from room temperature to temperatures up to at least 550° C. and by a stable, body-centered, cubic structure over the full range of temperature from room temperature up to the melting point.

3,625,676
VANADIUM-ALUMINUM-TITANIUM MASTER ALLOYS
Frederick H. Perfect, Wyomissing, Pa., assignor of fractional part interest to Reading Alloys, Inc., Robensonia, Pa.
No Drawing. Continuation-in-part of application Ser. No. 617,031, Feb. 20, 1967. This application Mar. 28, 1969, Ser. No. 811,581
Int. Cl. C22c *1/00, 21/00, 27/00*
U.S. Cl. 75—134 V 13 Claims

This invention relates to improved vanadium-aluminum-titanium master alloys free of slag voids and gross (macroscopic) nitride inclusions, by reason of which the master alloys are particularly useful in providing titanium base alloys of greater soundness. This invention also contemplates a novel process involving aluminothermic co-reduction of vanadium pentoxide and titanium dioxide to obtain such improved vanadium-aluminum-titanium master alloys.

3,625,677
ALUMINUM ALLOYS
Howard Jones, Saffron Walden, England, assignor to T.I. (Group Services) Limited, Edgbaston, Birmingham, England
Filed Dec. 26, 1968, Ser. No. 786,956
Claims priority, application Great Britain, Dec. 30, 1967, 59,285/67
Int. Cl. C22c *21/00*
U.S. Cl. 75—138 4 Claims

This invention relates to a range of aluminium alloys, and methods of preparing them. The materials are primarily binary alloys in which the minor constituent is iron, although a third constituent may be present, or even more, apart from impurities, without departing from the scope of



the invention and the second constituent may be elements other than iron but having a similar effect, as will be further exolained later.

3,625,678
NICKEL-CHROMIUM ALLOYS ADAPTED FOR PRODUCING WELDABLE SHEET
Edward Gordon Richards, West Hagley, Peter Lindsay Twigg, Halesowen, and Alfred John Fletcher, Hollywood, near Birmingham, England, assignors to The International Nickel Company, Inc., New York, N.Y.
No Drawing. Filed May 19, 1969, Ser. No. 825,924
Claims priority, application Great Britain, May 21, 1968, 24,266/68
Int. Cl. C22c *19/00*
U.S. Cl. 75—171 10 Claims

Nickel-base alloys containing chromium, cobalt, molybdenum carbon, hafnium and correlated amounts of aluminum, titanium, niobium, tantalum and vanadium and also boron with or without zirconium are particularly adapted for applications requiring welded sheet.

3,625,679
METHOD OF RAISING THE CONTENT OF NITROGEN AND OXYGEN IN TITANIUM
Howard B. Bomberger, Jr., Canfield, Ohio, assignor to RMI Company, Niles, Ohio
No Drawing. Filed Apr. 23, 1970, Ser. No. 31,400
Int. Cl. C22b *53/00;* C22c *15/00*
U.S. Cl. 75—175.5 4 Claims

A method of raising the content of nitrogen and oxygen in titanium by adding nitrites of nitrates of non-alloying metallic elements to the sponge before it is melted. The preferred compounds to be added are $NaNO_2$ and $NaNO_3$. Modern sponge is low in nitrogen and oxgyen. Additions of both these elements are needed to increase the strength of the product.

3,625,680
METHOD FOR PRODUCING POROUS URANIUM
Joseph J. Asbury, Knoxville, Tenn., assignor to the United States of America as represented by the United States Atomic Energy Commission
No Drawing. Filed Oct. 29, 1968, Ser. No. 771,633
Int. Cl. B22f *1/00*
U.S. Cl. 75—222 4 Claims

High-purity porous uranium articles are produced by preparing an admixture of particulate calcium oxide, magnesium metal, and uranium; pressing the mixture into a compact; sintering the compact in an inert atmosphere; and thereafter contacting the compact with acid solutions for removing the calcium oxide, magnesium, magnesium oxide, and uranium oxide.

3,625,681

METHOD OF LIQUID DEVELOPING A PHOTOCONDUCTIVE PLATE

Motohiro Takiuchi, Hirakata-shi, Yoshihiko Yamamoto, Nara-shi, and Yoshiki Hayashi, Hirakata-shi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Osaka, Japan

Filed Jan. 10, 1969, Ser. No. 790,234
Int. Cl. G03g; B44d *5/00*
U.S. Cl. 96—1 4 Claims

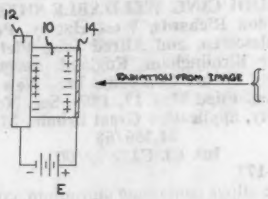
An improved electrophotographic image producing process capable of reproducing a highly resolved continuous-tone image. The process utilizes an electrophotographic plate having an insulating back layer. The process is characterized in that a uniform charge of the same polarity is given to both the top surface and the back surface of the electrophotographic plate.

3,625,682

NONREMOVABLE DISCONTINUOUS ELECTRODE FOR ELECTROPHOTOGRAPHY

Eugene A. Oster, Toledo, Ohio, and Barnett Rosenberg, Lansing, Mich., assignors to Owens-Illinois Inc.

Filed Nov. 29, 1968, Ser. No. 779,725
Int. Cl. G03g *13/22*
U.S. Cl. 96—1.4 5 Claims



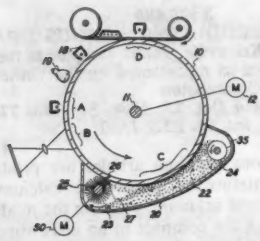
A persistent internal polarization (PIP) electrophotography printing or copying system comprising stationary electrodes which are not removed during development, and wherein at least one electrode is of a discontinuous configuration, such as a foraminous conductive mesh, which is embedded in or attached to the surface of the PIP layer which is to be toned (the top layer), such that an electric field can be applied to the PIP layer while permitting radiation to reach the PIP layer, and whereby toning and transfer may be accomplished without removing either electrode.

3,625,683

PROCESS FOR CLEANING A PHOTOCONDUCTIVE DRUM OF RESIDUAL TONER PARTICLES AND REUSE OF THE SAME

William C. Emerson, Rochester, N.Y., assignor to Xerox Corporation, Rochester, N.Y.

Filed Dec. 1, 1969, Ser. No. 881,043
Int. Cl. G03g *13/14*; B05b *5/02*
U.S. Cl. 96—1.4 2 Claims



A method for producing xerographic copies in which a photoconductor is moved in contact with a quantity of two component developer through an active development zone to create a flow pattern in the developer material, the improvement being characterized by removing the residual toner particles at the beginning of the development zone for reuse in the flow pattern.

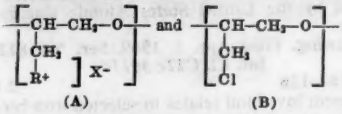
3,625,684

ELECTROCONDUCTIVE LAYERS FOR USE IN ELECTROGRAPHIC AND ELECTROPHOTOGRAPHIC RECORDING ELEMENTS

Albert Lucien Poot, Kontich, Jozef Frans Willems, Wilrijk, Francis Jeanne Sels, Kontich, and Johannes Josephus Vanheertum, Halle-Zandhoven, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed Apr. 29, 1969, Ser. No. 820,317
Claims priority, application Great Britain, Apr. 29, 1968, 20,256/68
Int. Cl. G03g *5/00*
U.S. Cl. 96—1.5 8 Claims

An electroconductive polymeric film useful in certain recording elements, especially electrographic recording elements including a photoconductive layer or other electrostatic charge retaining layer in electrical contact with such film, is composed of randomly distributed recurring units having the following formulae:



(A) (B)

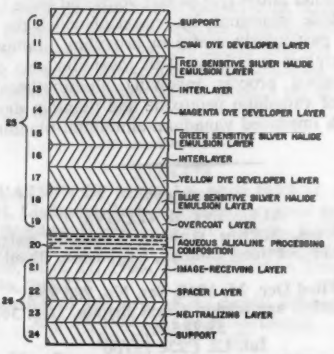
wherein units (A) constitute between about 25–95 mole percent of the total amount of such recurring units in the polymer, R is a quaternary ammonium, phosphonium, or tertiary sulfonium group and X is an anion.

3,625,685

PHOTOGRAPHIC COLOR DIFFUSION-TRANSFER ELEMENT COMPRISING AQUEOUS FILM-FORMING SYNTHETIC POLYMER SUSPENSION LAYERS INTERMEDIATE ITS SENSITIVE LAYERS AND PROCESSES FOR THEIR USE

James A. Avtges, Belmont, Jerome L. Reid, Natick, Lloyd D. Taylor, Lexington, and Herbert N. Schlein, Beverly, Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of application Ser. No. 880,205, Nov. 29, 1969. This application Feb. 26, 1971, Ser. No. 119,331
Int. Cl. G03c *1/04, 5/54, 7/00*
U.S. Cl. 96—3 34 Claims



Diffusion transfer photographic products comprising a support carrying at least two selectively sensitized silver halide emulsion layers, each having a dye which is a silver

halide developing agent of predetermined color associated therewith, and a layer intermediate the emulsion layers comprising a dye impermeable coalesced essence of an aqueous film-forming polymer dispersion and a processing composition permeable material associated therewith and adapted to render said layer permeable to solubilized dye image-forming material subsequent to being contacted with processing composition.

3,625,686

SIMULTANEOUS PHOTOPRINTING OF A PLURALITY OF REDUCED IMAGES

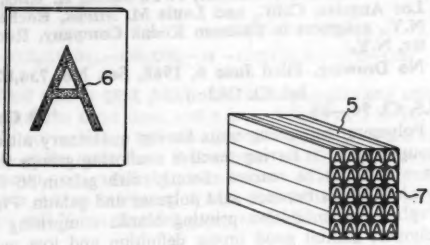
Ichiro Kitano, Kobe-shi, Hyogo-ken, Japan, assignor to Nippon Selfoc Kabushiki Kaisha (also known as Nippon Selfoc Co., Ltd.), Tokyo-to, Japan

Filed Aug. 19, 1969, Ser. No. 851,269

Claims priority, application Japan, Aug. 21, 1968, 43/60,094

Int. Cl. G03c *5/04*

U.S. Cl. 96—27 R 3 Claims



A method for simultaneously printing a plurality of reduced images of a pattern on a photosensitive material, which comprises the steps of interposing an optical fiber plate between said pattern and photosensitive material, said optical fiber plate being formed of a bundle of a plurality of optical fibers each having such a refractive index distribution in a cross section thereof as to substantially satisfy the relation

$$n=n_0(1-ar^2)$$

where n_0 represents the refractive index at the center thereof, n represents the refractive index at a radial point at a distance r from said center point, and a is a positive constant; and causing the transmission a reduced image of said pattern through each of said optical fibers forming said optical fiber plate, thereby and producing the reduced images on said photosensitive material.

Use of the method in the production of integrated circuits is disclosed.

3,625,687

PROCESS FOR MAKING NEGATIVE WORKING OFFSET MASTERS CONTAINING THIN GELATIN RELIEF IMAGES

Michael Patrick Dunkle, Matawan, N.J., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Aug. 16, 1966, Ser. No. 572,667

Int. Cl. G03f *7/02;* G03c *5/00*

U.S. Cl. 96—33 13 Claims

Process for making a planographic printing master which comprises (a) exposing the silver halide emulsion layer of a photographic film, (b) developing the layer to form reduced silver images in the exposed areas, (c) simultaneously or sequentially with (b) developing the layer by silver transfer development to form a silver surface image in the unexposed areas, (d) treating the developed layer with an acidic peroxide etch-bleach solution, and (e) removing the degraded colloid binder to uncover an oleophilic surface in the exposed areas and leave an oleophobic surface in unexposed areas.

3,625,688

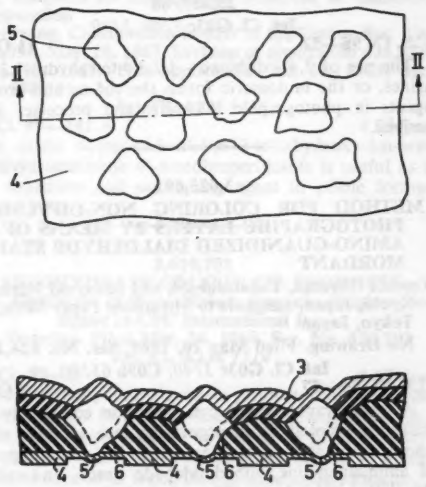
ELECTRICAL MONOGRAIN LAYERS AND METHOD FOR MAKING SAME

Ties Siebalt Te Velde, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Original application Aug. 1, 1966, Ser. No. 569,204, now Patent No. 3,480,818. Divided and this application May 13, 1969, Ser. No. 835,860

Int. Cl. G03g *5/00*

U.S. Cl. 96—36.2 11 Claims



A method of manufacturing a radiation-sensitive or electro-luminescent device in which a radiation-transparent electrode is provided on a monograin layer of electrically active grains with an electrically insulating filler material in the spaces between the grains. In this method, a porous electrode layer of relatively high electrical conductivity and relatively low permeability to radiation is provided over the monograin layer and filler after which the electrode layer is contacted with a liquid which penetrates through the pores of the electrode layer and selectively reacts with the grain surfaces in such manner as to disrupt the adhesion of the layer to the tops of the grains while leaving substantially intact its adhesion to the filler. This electrode layer is then removed from the grains to expose their tops and a second electrode layer having a relatively low electrical conductivity but a high radiation permeability is applied over the grains.

3,625,689

HIGH-CONTRAST PHOTOGRAPHIC ELEMENTS AND METHOD FOR PROCESSING SAME

Eugene D. Salesin and Thomas E. Whiteley, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed Aug. 18, 1967, Ser. No. 661,530
Int. Cl. G03c 5/26
U.S. Cl. 96—50 14 Claims

High-contrast photographic elements comprising a support coated with a silver halide emulsion which contains a dispersed polymerized vinyl compound and the halide comprises at least about 85 mole percent chloride, about 0.1 to about 5 mole percent iodide and the balance bromide, and method for processing same in a continuous transport processing machine wherein the developer contains a carbonyl bisulfite-amine condensation product.

3,625,690

PHOTOGRAPHIC MATERIAL CONTAINING 2,4 DITHIOXO-1,2,3,4 TETRAHYDRO-1,3,5 TRIAZINES

Jozef Frans Willems, Wilrijk, and Frans Clement Heugebaert, Kontich, Belgium, assignors to Gevaert-Agfa N.V., Mortsel, Belgium

No Drawing. Filed May 13, 1969, Ser. No. 824,289
Claims priority, application Great Britain, May 28, 1968, 25,457/68
Int. Cl. G03c 7/00, 5/30
U.S. Cl. 96—52 11 Claims

The use of 2,4 - dithioxo - 1,2,3,4-tetrahydro-1,3,5-triazines, or the tautomeric forms thereof as anti-bronzing agents in photographic materials and processes is described.

3,625,691

METHOD FOR COLORING NON-DIFFUSIBLY PHOTOGRAPHIC LAYERS BY MEANS OF AN AMINO-GUANIDIZED DIALDEHYDE STARCH MORDANT

Yasushi Ohyama, Takatsuki-shi, and Sadayuki Miyazawa, Kyoto, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

No Drawing. Filed May 20, 1969, Ser. No. 826,278
Int. Cl. G03c 1/40; C09b 65/00
U.S. Cl. 96—57 3 Claims

A photographic layer can be made completely non-diffusibly colored by incorporating into a binder of the photographic layer, a mordant which is a reaction product of aminoguanidine with dialdehyde starch, and coloring the photographic layer with an anionic dye.

3,625,692

PHOTOGRAPHIC MATERIAL HAVING SLIPPAGE-IMPROVING ADDITIVE IN SURFACE COATING

Karl-Otto Meyer, Leverkusen, and Wolfgang Himmelmann, Cologne-Stammheim, Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Germany

No Drawing. Filed Oct. 24, 1968, Ser. No. 770,423
Int. Cl. G03c 1/16
U.S. Cl. 96—67 3 Claims

Light sensitive photographic material having in at least one outer layer, as an anti-friction component, a water-insoluble compound of the formula:

$$R_1—O—CH_2·CHOH·CH_2—O—(R_3—O)_n—R_2$$

wherein R_1 is alkyl (preferably straight chain) of 8–24 carbon atoms, or aryl; R_2 is alkyl of 8–24 carbon atoms; R_3 is alkylene or phenylene, and n is an integer from 0 to 7.

3,625,693

THERMALLY DEVELOPABLE DIAZOTYPE COPYING MATERIALS

Takehiko Iwaoka, Tokyo, Japan, assignor to Kabushiki Kaisha Ricoh, Tokyo, Japan

No Drawing. Filed Nov. 3, 1967, Ser. No. 680,358
Claims priority, application Japan, Nov. 9, 1966, 41/73,630
Int. Cl. G03c 1/58
U.S. Cl. 96—75 2 Claims

Thermally developable diazotype copying materials comprising a support sheet and a light-sensitive layer supported thereon, said layer containing a light-sensitive diazo compound whose principal component consists of ortho-carboxy benzene diazonium chloride, said layer further containing a coupler, a thermally decomposable alkali generating agent (an agent adapted to produce an alkaline component due to the heat decomposition of said agent) and an acid stabilizer.

3,625,694

POLYMERS, POLYMERIC MORDANTS, AND ELEMENTS CONTAINING SAME

Hyman L. Cohen, Rochester, N.Y., James R. King, Jr., Los Angeles, Calif., and Louis M. Minsk, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 6, 1968, Ser. No. 734,873
Int. Cl. G03c 1/84, 1/72
U.S. Cl. 96—84 18 Claims

Polymers comprising units having quaternary nitrogen groups and units having reactive anchoring groups thereon which can be reacted directly with gelatin to form covalent bonds between said polymer and gelatin. Photographic dye imbibition printing blanks comprising said polymers exhibit good image definition and low matrix poisoning.

3,625,695

ANTISTATIC PHOTOGRAPHIC FILM

E. Scudder Mackey, Binghamton, N.Y., and Harvey Abend, Lexington, Ky., assignors to General Aniline & Film Corporation, New York, N.Y.

No Drawing. Filed May 9, 1967, Ser. No. 637,096
Int. Cl. G03c 1/82
U.S. Cl. 96—84 A 4 Claims

Antistatic agents for use with film-forming organic binders comprising the condensation product of an alkylene oxide having from 2 to 4 carbon atoms with 2,4,7,9-tetramethyl-5-decyne 4,7-diol, said condensation product having a molecular weight of at least 300.

3,625,696

PRODUCTION OF PRINTING PLATES

Carl Heinrich Krauch, Heidelberg, and Hans-Werner Otto, Ludwigshafen, Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,312
Claims priority, application Germany, Oct. 27, 1967, P 15 97 748.7
Int. Cl. G03c 1/68, 1/74
U.S. Cl. 96—86 P 7 Claims

The invention relates to plates, sheets or films applied to a highly reflective material, and which are used to prepart printing plates, said plates, sheets or films being formed from a mixture containing an indigoid dye and consisting of a polymeric base material, monomers having at least two polymerizable double bonds, photoinitiators and/or polymerization inhibitors.

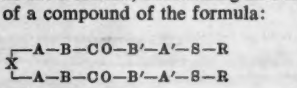
3,625,697

SENSITIZATION OF LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC EMULSIONS

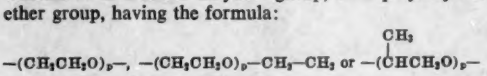
Shui Sato and Rintaro Ushiyama, Tokyo, Eiichi Sakamoto, Hanno-shi, and Sadatugu Terada and Hiroshi Yamada, Tokyo, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

No Drawing. Filed Dec. 10, 1969, Ser. No. 884,022
Claims priority, application Japan, Dec. 13, 1968, 43/90,990
Int. Cl. G03c *1/28, 1/34*
U.S. Cl. 96—107 5 Claims

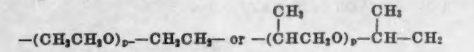
Light-sensitive silver halide emulsions are sensitized by incorporating into the emulsion, a sensitizing amount (0.1–1000 mg./kg.) of a compound of the formula:



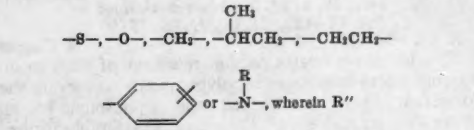
wherein A is a lower alkylene group, or a polyalkylene ether group, having the formula:



and which is not bonded through an oxygen atom to B; A' is a lower alkylene group, or a polyalkylene ether group having the formula



provided that A and A' are not both polyalkylene ether groups at the same time, and *p* is an integer of 2 to 30; B and B' are —NH— or —O—, provided that both are not —O— at the same time; R is a lower alkyl group, a phenyl group, an aralkyl group or $-(CH_2)_q-COOR'$, wherein *q* is an integer of 1 to 3, and R' is a lower alkyl group; and X is a divalent group of the formula:



is a lower alkyl group.

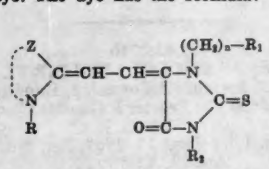
3,625,698

LIGHT-SENSITIVE SILVER HALIDE PHOTOGRAPHIC MATERIAL SENSITIZED WITH A THIOHYDANTOIN NUCLEUS CONTAINING DYE

Kaiichiro Sakazume, Shigemasa Itoh, and Shui Sato, Tokyo, and Eiichi Sakamoto, Hanno-shi, Japan, assignors to Konishiroku Photo Industry Co., Ltd.

Filed June 14, 1968, Ser. No. 737,147
Claims priority, application Japan, June 20, 1967, 42/39,037; Aug. 25, 1967, 42/54,205
Int. Cl. G03c *1/08*
U.S. Cl. 96—100 5 Claims

The photographic material emulsion layer contains a sensitizing dye. The dye has the formula:



wherein R is an alkyl group, a carboxy alkyl group or a sulfo alkyl group; R_1 is hydroxy, cyano, alkoxy, carboxy, acyloxy or carbamoyl; *n* is an integer of 2 to 3; R_2 is a substituted or unsubstituted alkyl, aryl, alkenyl or aralkyl; and Z means an atomic grouping capable of forming, together with the adjacent nitrogen and carbon atoms, a benzoxazole ring, a naphtho-oxazole ring, a thiazole ring, and indolenine ring or a quinoline ring.

3,625,699

SENSITIZATION OF PHOTOGRAPHIC SILVER HALIDE EMULSIONS CONTAINING COLOR-FORMING COMPOUNDS BY 1,1-BIS-SULFONYL ALKANES

Paul H. Stewart and Donald W. Heseltine, Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

No Drawing. Filed June 1, 1970, Ser. No. 42,605
Int. Cl. G03c *1/28, 1/40*
U.S. Cl. 96—107 17 Claims

The speed of photographic silver halide emulsions containing color-forming couplers is increased by processing in the presence of 1,1-bis-sulfonyl alkane speed increasing agents.

3,625,700

EDIBLE COMPOSITIONS CONTAINING 2',4',6',3-TETRAHYDROXY - 4 - n-PROPOXYDIHYDROCHALCONE 4'-β-NEOHESPERIDOSIDE

Leroy O. Krbechek, Deerfield, and George Inglett, Peoria, Ill., assignors to International Minerals & Chemical Corporation

No Drawing. Continuation-in-part of application Ser. No. 622,098, Mar. 10, 1967. Division of application 638,623, May 15, 1967. This application Oct. 23, 1969, Ser. No. 870,341
Int. Cl. A23l *1/26*
U.S. Cl. 99—141 A 4 Claims

The novel compound 2',4',6',3-tetrahydroxy-4-n-propoxydihydrochalcone 4'-β-neohesperidoside is useful as a sugar substitute and sweetening agent in edible formulations.

3,625,701

CARBOHYDRATE-GLUCONATE PRODUCTS

Raoul Guillaume Philippe Walon, Brussels, Belgium, assignor to CPC International Inc.

No Drawing. Filed Mar. 26, 1969, Ser. No. 810,783
Int. Cl. A23k *1/14*
U.S. Cl. 99—2 2 Claims

Covers carbohydrate-gluconate products and food compositions thereof formed by selectively oxidizing the glucose in starch hydrolyzates or greens to form carbohydrate-gluconic acid and carbohydrate-gluconate mixtures. Also covers mode of formation of these compositions.

3,625,702

PREPARATION OF SOUR MILK DRINKS

Heinrich Exler, Ravensberger Strasse 86, Borgholzhausen 4801, Germany

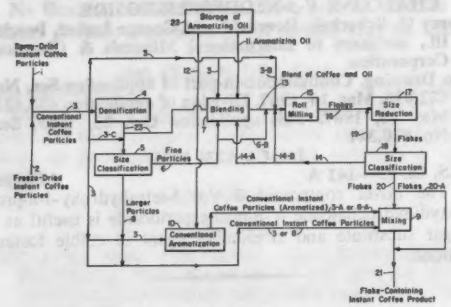
Filed July 18, 1969, Ser. No. 842,973
Claims priority, application Germany, July 20, 1968, P 17 92 084.2
Int. Cl. A23c *9/12*
U.S. Cl. 99—59 6 Claims

A sour milk drink is formed by souring skimmed fresh milk, adding an aqueous solution of citric acid and concentrated flavouring, followed by a mixture of pectin and sugar, homogenising the product in a first homogeniser at a temperature of approximately 15° C. and a pressure of 150 to 160 atmospheres gauge, heating the homogenised product to a temperature of from 51 to 54.5° C. and raising its pressure to 350 to 380 atmospheres gauge, homogenising the product in a second homogeniser at the latter temperature and pressure, pouring the product into bottles and pasteurising it for 20 to 30 minutes at an elevated temperature.

3,625,703
COFFEE ADDITIVE
John A. Ericson, 732 Market St., Youngstown, Ohio 44502
No Drawing. Filed July 6, 1970, Ser. No. 52,686
Int. Cl. A23f 1/04, 1/12
U.S. Cl. 99—65 3 Claims

A coffee additive mixed with ground roast coffee beans prior to brewing coffee therefrom includes dried yeast, dehydrated mustard, watercress, parsely and alfalfa greens and acts to reduce the acid and oil content of the brewed coffee.

3,625,704
INSTANT COFFEE FLAKES
James R. Andre, Leawood, Kans., and Frederick M. Joffe, Cincinnati, and David A. Strang, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Continuation-in-part of application Ser. No. 732,479, Apr. 26, 1968, which is a continuation-in-part of application Ser. No. 638,858, May 16, 1967. This application Dec. 4, 1968, Ser. No. 786,539
Int. Cl. A23f 1/00
U.S. Cl. 99—66 22 Claims



An instant coffee composition containing thin, dense flakes of instant coffee. The flakes are formed by roll milling instant coffee particles. Preferably, an aromatizing oil is contained in the flakes.

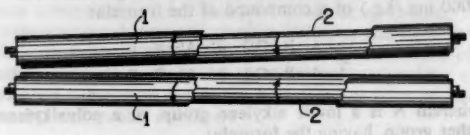
3,625,705
THERMOGRAVITATIONAL COFFEE EXTRACT CONCENTRATION
Charles W. Ehrgott, Rumson, N.J., assignor to General Foods Corporation, White Plains, N.Y.
No Drawing. Filed Aug. 7, 1969, Ser. No. 848,347
Int. Cl. A23f 1/08
U.S. Cl. 99—71 4 Claims

Coffee extract is passed through a narrow channel and a temperature differential is set up across the channel. The thermal difference thus imposed across the extract causes diffusional concentration of the extract, and the more concentrated extract separates out at the bottom of the channel, while dilute extract rises to the top of the channel.

3,625,706
SHORTENING AND CULINARY MIXES CONTAINING GLYCOLIPID EMULSIFIERS
David V. Myhre, Wyoming, and John E. Hunter, Springfield Township, Hamilton County, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed July 23, 1968, Ser. No. 746,774
Int. Cl. A21d 2/14; A23g 3/00; A23d 5/00
U.S. Cl. 99—94 8 Claims

Bakery compositions containing glycolipids, e.g., sugar glycosides esterified with long chain (C_{16}–C_{22}) fatty acids, are disclosed. The glycolipids are useful as oil/water emulsifiers in bakery and shortening compositions.

3,625,707
SYSTEM FOR HYDRATING DATES
David Reznik, Berkeley, Calif., assignor to the United States of America as represented by the Secretary of Agriculture
Filed Nov. 22, 1968, Ser. No. 778,165
Int. Cl. A23b 7/00
U.S. Cl. 99—100 3 Claims



Apparatus and process are disclosed for hydrating dates in order to render them plump and tender. The system of the invention involves first a fissuring of the skin of the fruit, followed by a vacuum hydration operation by which the moisture content of the fruit is rapidly increased without alteration of its natural flavor.

3,625,708
TREATMENT OF FLESH FOR FOOD
John H. Mahon, Scott Township, Allegheny County, and Kermit F. Schlamb, Pittsburgh, Pa., assignors to Calgon Corporation
No Drawing. Continuation-in-part of application Ser. No. 611,805, Jan. 26, 1967. This application Aug. 28, 1970, Ser. No. 68,044
The portion of the term of the patent subsequent to Dec. 29, 1987, has been disclaimed
Int. Cl. A22c 18/00, 21/00, 25/00
U.S. Cl. 99—107 4 Claims

This invention relates to the treatment of flesh in an aqueous slurry of sodium tripolyphosphate to prevent the formation of high concentrated areas of phosphate known in the trade as "fish eyes." The slurry is preferably formed by mixing sodium tripolyphosphate having a major portion in the size range 20 mesh to 80 mesh in water to form a very fine creamy suspension, preferably completely hydrated.

3,625,709
ACETALDEHYDE CARBOHYDRATE COMPLEX
William A. Mitchell, Lincoln Park, N.J., assignor to General Foods Corporation, White Plains, N.Y.
No Drawing. Filed Feb. 18, 1969, Ser. No. 800,246
Int. Cl. A23l 1/22, 1/26
U.S. Cl. 99—140 R 11 Claims

Formation of an acetaldehyde-carbohydrate composition is effected with a chloride salt catalyst. The resulting material has excellent room temperature stability over wide ranges of ambient humidities and has application as a food flavoring and aroma enhancer.

3,625,710
ALDIMINES AS CHOCOLATE-LIKE FLAVORS
George P. Rizzi, Springfield Township, Hamilton County, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
No Drawing. Filed June 25, 1969, Ser. No. 836,606
Int. Cl. A23l 1/22
U.S. Cl. 99—140 R 8 Claims

Aldimines are useful as chocolate-like or cocoa-like flavors. Examples of the compounds are N-isobutylidenefurfurylamine, N-isopentylidenefurfurylamine, and N-isopentylideneisopentylamine.

3,625,711

CYCLAMATE-FREE ARTIFICIAL SWEETENER

Marvin E. Eisenstadt, Belle Harbor, N.Y., assignor to Cumberland Packing Corporation, Brooklyn, N.Y.

No Drawing. Continuation-in-part of application Ser. No. 822,024, May 5, 1969, which is a continuation-in-part of application Ser. No. 794,767, Jan. 28, 1969, both now abandoned. This application Nov. 5, 1969, Ser. No. 874,413

Int. Cl. A23l *1/26*

U.S. Cl. 99—141 A 8 Claims

This invention relates to a saccharine artificial sweetening composition, and more particularly to a sweetening composition, which is free of cyclamate and contains only saccharine as the artificial sweetener but which contains additives which eliminate the undesired bitter aftertaste of saccharine. The additives which are used according to this invention, and which must be used in combination because the only sweetening agent is saccharine, are lactose or dextrose, but preferably lactose, and cream of tartar powder.

3,625,712

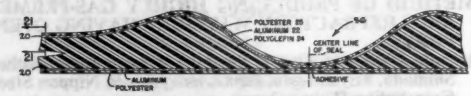
CONTROL OF DIFFUSION OF GASES IN POUCHES

Donald C. Wilson, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Nov. 20, 1969, Ser. No. 878,503

Int. Cl. B65b *39/00*

U.S. Cl. 99—171 H 16 Claims



Method, apparatus, and article of manufacture for controlling the diffusion of gases such as hydrogen out of sealed laminated pouches and the diffusion of gases such as oxygen into the sealed pouches, which pouches include an aluminum layer bonded to at least an inner layer of heat sealable plastic. During formation and sealing of the pouches the sealed edges of the pouches are compressed between opposed heated sealing bars, with at least one of the bars having a convex pouch contacting surface, the sealing force and temperature being sufficient to extrude the plastic sealant away from the sealed area allowing the aluminum layers of the two pouch walls to be moved substantially into aluminum to aluminum contact with each other and to establish a substantially continuous aluminum envelope around the contents of the pouches. The pouches are also filled with a water containing product and are heated to a sterilizing temperature which forms aluminum oxide on the aluminum surfaces which oxide prevents diffusion of gases out of or into the pouches by providing a substantially continuous gas inhibiting barrier or envelope around the contents of the pouches.

3,625,713

METHOD FOR PACKAGING MEAT

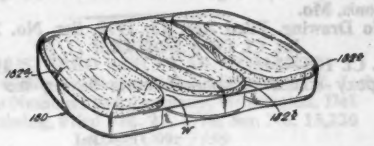
George A. Mixon, Fort Lauderdale, Fla., assignor to Mol-Pak Corp., Fort Lauderdale, Fla.

Application Oct. 25, 1968, Ser. No. 770,530, now Patent No. 3,526,077, dated Sept. 1, 1970, which is a continuation-in-part of application Ser. No. 479,949, Aug. 16, 1965. Divided and this application May 1, 1970, Ser. No. 33,808

Int. Cl. A23b *1/06;* B65b *25/06*

U.S. Cl. 99—194 1 Claim

A method for packaging meat products and the like consisting of the steps of slicing a cut of meat of predetermined size and shape, positioning the cut of meat in a tray having at least one cavity section with a sidewall slightly smaller than the thickness of the cut and a base



conforming generally to the cross section of the cut so that the cut of meat fits snugly therein, enveloping the tray and cut in a heat shrinkable filmy material and freezing the packaged meat product.

3,625,714

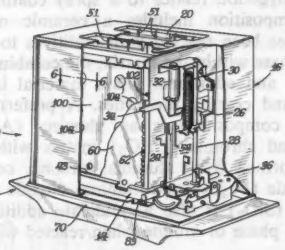
TOASTER BASE WITH INTEGRAL BAFFLE PLATES

Franklin C. Hitzeroth, Centerville, and David B. Walitzer, Appanoose County, Iowa, assignors to McGraw-Edison Company, Elgin, Ill.

Filed Jan. 12, 1970, Ser. No. 2,139

Int. Cl. A47j *37/08*

U.S. Cl. 99—389 7 Claims



A toaster having an insulating phenolic base to which the toaster chassis and case are secured, the base including integral upstanding baffles which serve in part to separate the toasting chambers from end compartments formed between the case and chassis, and further having plates selectively secured to the chassis between the heating elements and the inner face of the case for rendering immaterial the case construction, be it of a highly polished chrome or a duller finished porcelain material.

3,625,715

POLYETHYLENE OXIDE DAMPENING SYSTEM FOR LITHOGRAPHIC PRESSES

Salvatore Nasca, 74 Birch Lane, Woodmere, N.Y. 11598

No Drawing. Filed July 1, 1970, Ser. No. 51,694

Int. Cl. C09d *5/00;* C09k *3/00*

U.S. Cl. 106—2 2 Claims

The volatility and atmospheric contamination of alcoholic dampening solutions is avoided by the use of an aqueous solution of polyethylene oxide of molecular weight 50,000 to 150,000 with isopropyl alcohol, diethylene glycol, glycerine, a silicone-glycol copolymer surfactant and as an antiforming agent preferably a silicone emulsion. The solution may be substituted for conventional alcohol solutions without change in operating procedures.

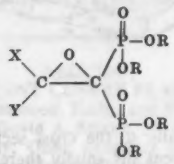
3,625,716

METHODS OF INHIBITING CORROSION WITH EPOXY ETHANE POLYPHOSPHONATE COMPOSITIONS

Thomas M. King, St. Louis, and Howard L. Vandersall, Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

No Drawing. Filed Apr. 13, 1970, Ser. No. 27,987
Int. Cl. C09d 5/08; C23f 11/10
U.S. Cl. 106—14 19 Claims

Epoxy ethane polyphosphonates having the formula



wherein X and Y are hereinafter defined and R is hydrogen or a metal ion, alone or in combination with zinc, dichromate, certain thiols and 1,2,3-triazoles and mixtures thereof, are disclosed as inhibiting the corrosion of metals by oxygen-bearing waters.

3,625,717

SPRAY COATING COMPOSITIONS

Donald C. Grubba, Westboro, and John D. Peterson, North Grafton, Mass., assignors to AVCO Corporation, Cincinnati, Ohio

Filed Apr. 29, 1968, Ser. No. 724,906
Int. Cl. C04b 33/00
U.S. Cl. 106—39 R 4 Claims

The invention relates to a spray coating composition. The composition includes a ceramic matrix material which has been reacted with additives to form an additional phase within the matrix; the combination of matrix material and additional phase material improving coatability and coating properties. A preferred example of such a composition is an alumina (Al_2O_3), zirconia (Zr_2) and chromia (Cr_2O_3) matrix with an additional phase formed from alumina, zirconia or chromia with iron oxide (Fe_2O_3) and titanium dioxide (TiO_2). Silicon dioxide (SiO_2) is also a candidate additive for forming a glassy phase or mullite when reacted with the alumina.

3,625,718

NEW THERMALLY CRYSTALLIZABLE GLASSES AND LOW EXPANSION TRANSPARENT, TRANSLUCENT AND OPAQUE CERAMICS MADE THEREFROM

Richard W. Petticrew, Perrysburg, Ohio, assignor to Owens-Illinois, Inc.

No Drawing. Continuation of application Ser. No. 630,507, Apr. 13, 1967. This application Oct. 13, 1969, Ser. No. 866,168
Int. Cl. C04b 33/00
U.S. Cl. 106—39 DV 10 Claims

The present patent application discloses compositions of matter in the form of glasses composed mainly of silica and alumina and containing other essential ingredients. The glasses of the invention are quite refractory and thermal shock resistant, having annealing point temperatures of at least 1100° F. and coefficients of thermal expansion in the range 30 to 50×10^{-7}/° C. over the range zero to 300° C.; they also have liquidus temperatures of less than 2550° F. The refractory glasses can be formed in the usual ways by pressing, blowing, etc., to make a variety of useful articles such as tableware and ovenware. Other essential ingredients of the glasses include lithium oxide and zinc oxide; these ingredients provide the necessary viscosity reduction so that the said forming processes can be employed. After the desired glass articles are formed they can be used as such. However, another product disclosed in the application is the product of heat treatment of the glasses of the invention. The remaining two ingredients of the present compositions, zirconium dioxide and titanium dioxide, contribute to the reduction in viscosity of the glass melts. They are also important in aiding in formation of the products of heat treatment of the present glasses, which are low-expansion crystalline ceramics that contain a multiplicity of very fine crystals dispersed in a glassy matrix. The following specification describes in more detail (1) how to carry out the heat treatment, (2) the properties of the glasses and (3) the properties of the ceramics which are derived from the glasses.

3,625,719

PORCELAIN ENAMEL COVER COAT MILLING

Francis C. Ellinger, Warrensville Heights, Ohio, assignor to Ferro Corporation, Cleveland, Ohio

No Drawing. Continuation of application Ser. No. 668,168, Sept. 15, 1967. This application Apr. 29, 1970, Ser. No. 31,821
Int. Cl. C03c 5/02
U.S. Cl. 106—48 4 Claims

An improved acid resistant titania opacified porcelain enamel cover coat for application to metal substrates by conventional process methods, comprising, in combination, an acid resistant titania opacified frit milled for wet process application with in excess of 5% clay, said frit containing at least 10% B_2O_3 said enamel milled to an extremely fine particle size.

3,625,720

METHOD OF PRODUCING HIGHLY GAS-PERMEABLE REFRACTORY MATERIAL HAVING OPEN PORES

Hiroshi Ohba and Kiyoshi Sugita, Kitakyushu, and Kohei Shimada, Miyako-gun, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

No Drawing. Filed Oct. 23, 1967, Ser. No. 677,045
Claims priority, application Japan, Oct. 24, 1966, 41/70,142
Int. Cl. C04b 35/42
U.S. Cl. 106—59 4 Claims

The present invention relates to a method of producing highly gas-permeable refractory material having open pores characterized by mixing unfired chrome ore grains and dead-burnt magnesia grains in the ratios of chrome ore/magnesia of 80/20 to 30/70 to prepare a mixture, which contains fine grains of both materials in an amount less than 20% of the total and forming the mixture to bricks, which are then fired at a temperature ranging from 1,650 to 1,750° C.

3,625,721

PERMEABLE REFRACTORIES

Gordon E. D. Snyder, Baltimore, and Wate T. Bakker, Severna Park, Md., assignors to General Refractories Company, Philadelphia, Pa.

No Drawing. Filed Jan. 5, 1970, Ser. No. 829
Int. Cl. C04b 35/10
U.S. Cl. 106—65 24 Claims

Permeable refractories are prepared from a refractory brick batch mix consisting essentially of about 85 to 95 percent alumina, about 3.99 to 13.99 percent silica, about 0.01 to 0.5 percent of at least one lithium compound capable of oxidizing to lithium oxide and about 1 to 5 percent bentonite. About 65 to 85 percent by weight of the particles in the mix should be in the range of about 8 to 200 mesh and at least 10 percent of the particles should be 325 mesh or smaller. A major portion of the particles in the 8 to 200 mesh range should be of a size such that the ratio of the diameter of the largest particles of the major portion to the diameter of the smallest particles thereof is in the range of 3:1 to 1:1. These refractories have a permeability of at least 500 centidarcys at 25 p.s.i. back pressure.

3,625,722

PROCESS FOR THE PREPARATION OF STABILIZED ALKALI METAL SILICATE SOLUTIONS

Helmut v. Freyhold, Dusseldorf, Oberkassel, and Volker Wehle, Hilden Rhineland, Germany, assignors to Philadelphia Quartz Company, Philadelphia, Pa.

No Drawing. Filed Jan. 2, 1968, Ser. No. 694,880
Claims priority, application Germany, Jan. 13, 1967, H 61,550
Int. Cl. C09d *1/04*
U.S. Cl. 106—74 18 Claims

This application describes a process for preparing stable alkali metal silicate solutions with silica contents of from 10 to 35% and mole ratios ranging between 4:1 and 12:1 SiO_2:alkali metal oxide. Stability is obtained by incorporating sufficient amounts of certain quaternary ammonium compounds so that the mole ratio of silica to quaternary compound (calculated as quaternary ammonium oxide) ranges from 35:1 to 1000:1.

3,625,723

FOAMED CERAMIC COMPRISING FLY ASH AND PHOSPHORIC ACID

Richard W. Sicka, Brecksville, Ohio, assignor to Horizons Incorporated, a division of Horizons Research Incorporated

No Drawing. Filed Aug. 5, 1969, Ser. No. 847,720
Int. Cl. C04b *1/00*
U.S. Cl. 106—86 7 Claims

A lightweight foamed ceramic containing fly ash, an acidic phosphate and a filler which sets hydraulically with the phosphate without heating.

3,625,724

CELLULAR CONCRETE AND METHOD FOR PRODUCING THE SAME

Jesus S. Alvero, Quezon City, Republic of the Philippines, assignor to Altrona Corporation, Paco Manila, Republic of the Philippines

Filed Sept. 23, 1968, Ser. No. 761,551
Int. Cl. C04b *13/124, 21/02*
U.S. Cl. 106—87 24 Claims

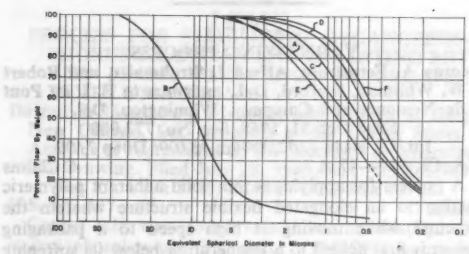
Cellular concrete, and a method and apparatus for producing the same in which a multitude of substantially closed cells are produced. During production of the concrete, the cells have a substantially impervious coating or "shell" thereon to permit hardening of the concrete to occur without interference from the production and expansion of the cells.

3,625,725

SATIN WHITE-CLAY COMPOSITIONS AND METHODS OF MANUFACTURE

Robert F. Conley, Scotch Plains, and Mary Kate Lloyd, Westfield, N.J., and Billy Reid Catherwood, Macon, Ga., assignors to Georgia Kaolin Company

Filed Apr. 24, 1969, Ser. No. 818,877
Int. Cl. C09c *1/02*
U.S. Cl. 106—306 6 Claims



A coating pigment composition of kaolin and satin white is provided in which the kaolin is classified from natural kaolin deposits to a particle size of about 80% to 96% by weight less than 2μ, about 55% to 85% less than 1μ, and no more than about 10% less than 0.2μ, said size values being determined by the standard centrifugal-hydrometer method.

3,625,726

CLUSTERED ACICULAR PIGMENTS

Hugh C. Gulledge, Newark, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

No Drawing. Filed Feb. 27, 1970, Ser. No. 15,220
Int. Cl. C09c *1/36*
U.S. Cl. 106—299 5 Claims

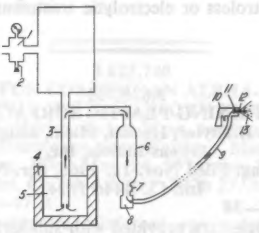
Previously-formed fibrous materials which are suspended in a liquid are subjected to mechanical shear under controlled conditions to produce clustered acicular pigments characterized by, for example, an average diameter of from about 5 to 500 microns and an average density of from about 7 to 40 percent of the theoretical density wherein the individual acicular particles have an average diameter of from about 0.1 to 5 microns and a length-to-diameter ratio of from about 10 to 1000.

3,625,727

PROTECTIVE COATINGS

David Reginald Lightfoot, Clarksville, Md., and Roy Henry Sowden, St. Neots, England, assignors to W. R. Grace & Co., New York, N.Y.

Filed May 20, 1969, Ser. No. 826,144
Claims priority, application Great Britain, May 20, 1968, 23,967/68; Dec. 4, 1968, 57,701/68
Int. Cl. B44d *1/08, 1/34*
U.S. Cl. 117—6 11 Claims



A strippable protective coating is formed on a substrate, especially a vehicle body, by spraying from a molten composition onto it. The molten composition preferably contains a mixture of a film-forming copolymer of ethylene and vinyl acetate and an auxiliary polymer, preferably another ethylene/vinyl acetate copolymer, of molecular weight below 10,000.

3,625,728

HARD SURFACE TRANSPARENT MASK

Eugene R. Blome, San Jose, and Samuel S. M. Fok, Palo Alto, Calif., assignors to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Filed Nov. 13, 1967, Ser. No. 682,458
Int. Cl. C03c *17/22*; B44c *1/50*
U.S. Cl. 117—37 3 Claims

A mask comprising a hard surface layer formed into a desired pattern is provided for use in photo fabrication.

The layer is visually transparent but opaque to the range of wave lengths used to expose the photopolymer on the part being photo fabricated.

3,625,729
DISCONTINUOUS POLYCARBONATE COATINGS
Thomas S. Grabowski, Vienna, W. Va., assignor to Borg-Warner Corporation, Chicago, Ill.
No Drawing. Filed June 12, 1968, Ser. No. 736,255
Int. Cl. B44d *5/00*
U.S. Cl. 117—37 3 Claims

A method of making a discontinuous polycarbonate coating on a thermoplastic substrate comprising the steps of dissolving a polycarbonate resin in a solvent containing at least some developing solvent, applying the polycarbonate-solvent solution to the thermoplastic substrate to form a coating and evaporating the solvent from said polycarbonate coating to thereby form a discontinuous coating surface.

3,625,730
CONDUCTIVE DESIGNS AND PROCESS FOR THEIR MANUFACTURE
Sung Ki Lee, Niagara Falls, N.Y., assignor to Hooker Chemical Corporation, Niagara Falls, N.Y.
No Drawing. Filed May 6, 1968, Ser. No. 727,045
Int. Cl. B44d *1/18;* H05k *1/00*
U.S. Cl. 117—38 16 Claims

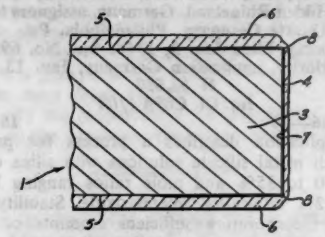
Printed circuits, integrated circuits, resistors, thermocouples, condensers, superconductors, electroformed materials, and the like are produced by providing a plastic or substantially non-metallic substrate with a metal phosphide; applying a resist; removing the unprotected metal phosphide; dissolving the resist; and subjecting the substrate to electroless or electrolytic treatment.

3,625,731
STAINING PLASTIC SURFACES
Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc.
No Drawing. Filed Nov. 12, 1968, Ser. No. 775,127
Int. Cl. B44d *1/24*
U.S. Cl. 117—38 9 Claims

Plastic articles are provided with sub-surface markings which are scuff-proof and resistant to acid, alkali and solvent attack; a staining composition which includes a penetrating dye and a carrier medium comprised of a water-soluble or water-dispersible resin or polymer is applied to a plastic surface in a desired pattern, the surface and staining composition are then suitably processed to effectuate at least a partial diffusion of the dye beneath the surface and the residual composition is removed from the surface by treatment with water or an aqueous medium, thereby resulting in a durable and resistant subsurface pattern.

3,625,732
METHOD OF PROTECTING SHARP CORNERS AND EDGES OF CARBON STEEL SUBSTRATES
Forrest W. Nelson, Pewaukee, Wis., assignor to A. O. Smith Corporation, Milwaukee, Wis.
Continuation-in-part of application Ser. No. 474,003, July 22, 1965. This application July 5, 1966, Ser. No. 563,947
Int. Cl. C23c *7/00;* C23d *5/00*
U.S. Cl. 117—43 7 Claims

A method of protecting the sharp corners or edges of a carbon steel base from corrosion. A corrosion resistant metal is sprayed onto the edges of the carbon steel to be protected to provide a corrosion resistant coating on the edges. Subsequently a glass slip is applied to the article and over the porous metal coating. The article is then fired at an elevated temperature, above the melting point of the glass, to melt the glass and the molten glass flows to completely fill the voids in the porous metal coating.



3,625,733
SUBSTRATE COATING PROCESS
Fred E. Mansur, Toledo, Ohio, assignor to Owens-Illinois, Inc.
No Drawing. Filed May 16, 1969, Ser. No. 825,410
Int. Cl. C23l *5/02;* C23c *17/00*
U.S. Cl. 117—46 CA 5 Claims

There is disclosed a process for coating a substrate which comprises applying to the substrate a polymeric based composition comprising a finely divided, particulate inorganic material dispersed in a cyclic isoprenoid solvent and a low molecular weight, low vapor pressure, liquid polymer, said polymer consisting of a poly (alpha substituted) styrene and having a relatively constant viscosity and thixotropic character and capable of being decomposed or pyrolyzed completely to gaseous products at a relatively low temperature without forming a carbonaceous or like residue having a deleterious effect(s) in the application of the composition to the substrate.

3,625,734
ULTRA-THIN LIQUID MEMBRANE CONSTRUCTION
William J. Ward III, Schenectady, N.Y., assignor to the United States of America
No Drawing. Filed Oct. 16, 1969, Ser. No. 867,088
Int. Cl. B44d *1/14;* B23d *27/08*
U.S. Cl. 117—46 CA 5 Claims

A method for the preparation of a stable immobilized liquid membrane having a thickness of 0.1 mil, or less, is described. The preparation of such a membrane construction comprising polyethylene glycol supported on a porous polymer membrane (rendered non-wetting by the deposition of sub-micron size particles of polytetra-fluoroethylene thereover) is described, the particular membrane having specific application to the separation of sulphur dioxide from gas mixtures.

3,625,735
YARN SIZING PROCESS
George A. Fernstrom, Alfred J. Strohmaier, and Robert W. Whitman, Seaford, Del., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.
Filed Oct. 31, 1968, Ser. No. 772,080
Int. Cl. B44d *1/02;* D06m *13/00;* D06p *7/00*
U.S. Cl. 117—47 A 6 Claims

A process for applying a thin solid adherent polymeric coating to an elongated flexible structure wherein the structure while moving at high speed to a packaging means is first heated to a temperature below its softening point and then while still hot, coated with an unheated liquid mixture comprising an inert, high-boiling solvent and an adherent polymeric coating material. The rela-

tionship of speed, temperature and thickness of the liquid mixture applied being such to allow vaporization of the

solvent and drying of the polymeric material on the flexible structure before packaging.

3,625,736

PRESSURE-SENSITIVE COPYING UNIT CONTAINING GRANULAR RESINOUS MATERIAL AND METHOD OF MAKING

Hiroharu Matsukawa, Shizuoka, and Keitaro Ohe, Daijiro Nishio, and Nobuo Tsuji, Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

No Drawing. Filed Oct. 28, 1968, Ser. No. 771,366
Claims priority, application Japan, Oct. 27, 1967, 42/69,045
Int. Cl. B41m *5/22*
U.S. Cl. 117—36.2 17 Claims

A process for reinforcing microcapsules used in pressure sensitive copying papers which comprises incorporating a granular resinous polymer in a coating liquid containing the microcapsules and coating the liquid on a paper support to prepare a pressure sensitive copying paper. The microcapsules contain an adsorbable colorless organic compound which forms a color dyeing contact with an electron receptive adsorbent material. Specific resinous materials are defined in the specification. A pressure sensitive copying paper and a pressure sensitive copying unit utilizing the above materials is also described.

3,625,737

PROTECTIVE COATING AND METHOD OF MAKING

Edmund N. Ricchezza, deceased, late of Henderson, N.C., by Barbara C. Ricchezza, executrix, Henderson, N.C., and Robert H. Doremus, Schenectady, N.Y., assignors to General Electric Company

No Drawing. Filed Nov. 21, 1969, Ser. No. 878,888
Int. Cl. B44d *1/44*
U.S. Cl. 117—62 10 Claims

Protective silicate coating on aluminum reflector with aluminum oxide film on its surface is treated with ammonium fluoride solution and thereafter with nitric acid to remove substantially all the alkali metal ions in the silicate coating to avoid formation of haze in the coating when exposed to the atmosphere.

3,625,738

PROCESS FOR STABILIZING ORGANOPHOSPHORUS SOLUTIONS AND IMPARTING ROT AND FLAME RESISTANCE TO ORGANIC TEXTILE MATERIALS

Darrell J. Donaldson, Metairie, and Donald J. Daigle, New Orleans, La., assignors to the United States of America as represented by the Secretary of Agriculture

No Drawing. Filed July 28, 1969, Ser. No. 845,562
Int. Cl. C09k *3/28;* B44d *1/44;* D06m *13/26*
U.S. Cl. 117—63 7 Claims

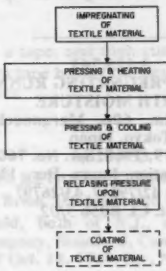
Copper salts were found to stabilize tetrakis(hydroxymethyl)phosphonium hydroxide (THPOH)-ammonium hydroxide solutions by formation of a complex thereby making it possible to apply THPOH to cotton fabric from a single bath without the use of gaseous ammonia.

3,625,739

METHOD OF MAKING FORAMINOUS FORMING CONVEYOR

Peter D. Kaspar, Earl C. Francis, and Clifton H. Hubbard, Jr., Dover, Del., assignors to International Playtex Corporation, Dover, Del.

Filed Feb. 16, 1968, Ser. No. 706,067
Int. Cl. B44d *1/44*
U.S. Cl. 117—65.2 13 Claims


IMPREGNATING OF TEXTILE MATERIAL
PRESSING & HEATING OF TEXTILE MATERIAL
PRESSING & COOLING OF TEXTILE MATERIAL
RELEASING PRESSURE UPON TEXTILE MATERIAL
COATING OF TEXTILE MATERIAL

A method of making a foraminous forming conveyor from textile sheet material having a lace-like design by treating such material so as to provide a dimensionally stable conveyor having flexibility sufficient to allow it to travel in straight and curved paths and further having a flat forming surface for receiving deposited solidifiable material; such deposited material, after solidification, being easily stripped from the forming surface in a continuous and effective manner.

3,625,740

PROCESS FOR COATING AN ALPHA-ALUMINA BODY WITH AN EPOXY RESIN

George F. Hurley, Acton, Mass., assignor to Tyco Laboratories, Inc., Waltham, Mass.

No Drawing. Filed Mar. 24, 1970, Ser. No. 22,393
Int. Cl. B44d *1/092;* B32b *27/38*
U.S. Cl. 117—47 R 11 Claims

Improved sapphire reinforced epoxy composites and method of making same. The sapphire reinforcing elements are coated with an organic silane to promote adhesion between the sapphire elements and the epoxy matrix. Absorption of the silane by the sapphire reinforcing elements is achieved by contacting the sapphire elements with a nonaqueous solution comprising the silane and an acid.

3,625,741

METHOD OF BONDING POLYMERS OF GLYCOL ACRYLATES AND METHACRYLATES TO HYDROPHOBIC SURFACES

Vladimir Stoy, Karel Kliment, Miroslav Stol, and Jiri Vodnansky, Prague, Czechoslovakia, assignors to Ceskoslovenska Akademie Ved, Prague, Czechoslovakia

No Drawing. Filed May 8, 1968, Ser. No. 727,674
Claims priority, application Czechoslovakia, May 12, 1967, 3,440/67
Int. Cl. B44d *1/14;* B32b *15/08*
U.S. Cl. 117—75 8 Claims

Layers of hydrophilic polymers of glycol acrylates and methacrylates, which swell and shrink under varying ambient humidity, are firmly bonded to dimensionally stable substrates by an interposed primer film of mixtures or copolymers of the same materials with hydrophobic constituents, the latter being present in a sufficient amount to reduce the moisture-induced swelling and shrinking of the primer to less than that of the hydrophilic polymer.

3,625,742

DIMETHYL FORMAMIDE SOLUBLE POLYURETHANE BONDED TO METAL USING AN EPOXY-POLYAMIDE PRIMER

Philip Nixon Baldwin, Jr., Villa Park, Ill., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed May 22, 1968, Ser. No. 731,307
Int. Cl. B32b *15/08*
U.S. Cl. 117—75 1 Claim

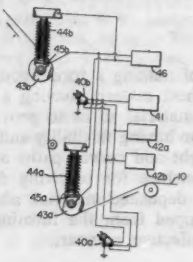
Polyurethane soluble in dimethylformamide, dimethylsulfoxide, or mixtures of these solvents is bonded to metal by means of an adhesive consisting of an epoxy resin and a polyamide.

3,625,743

METHOD FOR IMPREGNATING RUNNING PAPER WITH MOISTURE

Tamotsu Watanabe, Rm. 606, Marunouchi Bldg., Marunauchi, Chiyoda-ku, Tokyo, Japan

Filed Sept. 19, 1968, Ser. No. 760,815
Claims priority, application Japan, Dec. 12, 1967, Apr. 23, 1968; 42/79217, 43/26797
Int. Cl. B05b *5/02*
U.S. Cl. 117—93.4 NC 11 Claims



Electrostatically impregnating sprayed liquid particles onto a moving sheet of paper. An attracting electrode, electrically insulated from ground, is maintained at a high potential. A predetermined number of spray nozzles are connected to a liquid supply source maintained at ground potential, and these spray liquid onto the moving paper while the paper is moved along the electrode, the nozzles and electrode being on opposite sides of the paper. The nozzles are spaced from the electrode, and they are arranged in parallel across the paper so as to cover the full paper width with liquid particles.

3,625,744

METHOD OF COATING USING ACTINIC RADIATION

Kiyoshi Juna; Hiroyuki Nakayama, and Kiyohiko Asada, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Limited, Amagasaki-shi, Hyogo-ken, Japan

Filed Mar. 4, 1970, Ser. No. 16,592
Claims priority, application Japan, Mar. 7, 1969, 44/16826
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 10 Claims

A method of coating comprising the steps of applying a photosensitive catalyst or a mixture of a combination of said catalyst and a photosensitizer or a combination of said catalyst, said photosensitizer and polymeric materials on a substance to be coated, irradiating actinic light rays upon said substance while said substance being contacted with a vaporized ethylenically unsaturated compound or compounds, and thereby forming a polymer film of said ethylenically unsaturated compound or compounds.

3,625,745

ANTITHROMBOGENIC ARTICLE AND PROCESS

Archibald N. Wright, and Hans-Dieter Becker, both of Schenectady, N.Y., assignors to General Electric Company

Filed Mar. 18, 1970, Ser. No. 20,817
Int. Cl. B44d *1/50*
U.S. Cl. 117—93.31 13 Claims

A thin, continuous adherent coating is formed on a substrate by ultraviolet surface photopolymerization of a synthetic organic antithrombogenic compound in the gaseous phase. The resulting coated article exhibits antithrombogenic behavior and is suitable for prosthetic use.

3,625,746

STARCH/POLYVINYL ALCOHOL/N-METHYLOL ACRYLAMIDE PAPER SURFACE COATING COMPOSITION

Yaichi Ayukawa, 1168, Okamoto-cho, Setagaya-ku, Tokyo; Seishi Shinya, Maebara-cho, Funabashi-shi; Teiko Kakegawa, Ohwada, Yachiyo-cho, both of Chibaken, and Masako Ito, Jingumae, Shibuya-ku, Tokyo, all of Japan

Filed Sept. 8, 1969, Ser. No. 856,175
Int. Cl. C08b *25/02*; C08f *1/24*; D21h *1/24*
U.S. Cl. 117—93.31 30 Claims

A paper coating comprising the reaction product of a starch material, polyvinyl alcohol and an N-methylol acrylamide, plus a clay.

3,625,747

PHOTOCONDUCTIVE POWDERS AND A METHOD FOR PRODUCING THE SAME

Hiroyuki Kaneko; Keitaro Ohe; Shigero Sadamatsu, and Daijiro Nishio, all of Kanagawa, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Feb. 9, 1968, Ser. No. 704,270
Claims prioity, application Japan, Feb. 9, 1967, Feb. 9, 1967; 42/8553, 42/8554
Int. Cl. G03g *5/08*
U.S. Cl. 117—100 R 3 Claims

A manufacturing process for producing an electrophotographic photoconductive power material comprising the steps of dispersing synthetic resin monomer and powdered photoconductor particles in a liquid dispersion medium which is not compatible with the said monomer, and while maintaining such dispersed condition, polymerizing the monomer to form polymer particles containing the photoconductor particles therein.

3,625,748

PROCESS FOR SEALING STRUCTURES

Anton Aregger, Mutschellen; Reinhard Rutz, Neuenhof (Aargau), and Lutz Zabel, Zurich, all of Switzerland, assignors to Kaspar Winkler & Co., Zurich, Switzerland

Filed Oct. 20, 1969, Ser. No. 867,889
Claims priority, application Switzerland, Oct. 23, 1968, 15859/68
Int. Cl. B44d *1/08*, *1/02*
U.S. Cl. 117—105.5 7 Claims

A process is disclosed for sealing leaks due to the existence of a liquid-permeable discontinuity or overall porosity in a structure such as a foundation or tunnel. The process disclosed involves the steps of initially introducing a polymer or mixtures thereof, preferably in powdered or granulated form, together with a filler and a liquid gelling agent, separately, into a device which is suitable for transporting, mixing and spraying the mixture when so admixed. Optional ingredients disclosed which are also useful include metallic oxides, for instance. The mixtures are applied to a structure and are particularly valuable for preventing the penetration of water through such structure.

3,625,749

METHOD FOR DEPOSITION OF SILICON DIOXIDE FILMS

Satoshi Yoshioka, Nishinomiya-shi, and Shigetoshi Takayanagi, Kyoto, both of Japan, assignors to Matsushita Electronics Corporation, Osaka, Japan

Filed Mar. 31, 1967, Ser. No. 627,407
Claims priority, application Japan, Apr. 6, 1966, 41/27607
Int. Cl. C23c *11/08*, *11/00*
U.S. Cl. 117—106 A 5 Claims

An improved method for depositing silicon dioxide film on surfaces of substrates, which are stable at temperatures of 730° C. and above, by passing onto the surfaces thereof maintained at 730° C. or above, a gaseous hydrogen-carbon dioxide-silicon tetrafluoride mixture wherein the silicon tetrafluoride concentration is 0.005–0.1 percent by volume and the carbon dioxide concentration is 8 to 92 percent by

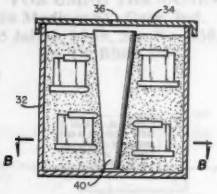
volume. The film is useful for diffusion-masking films for selective diffusion in fabrication or for passivating films.

3,625,750

COATING PROCESS

Sanford Baranow, Woodbridge, and William R. Freeman, Jr., Easton, both of Conn., assignors to Avco Corporation, Stratford, Conn.

Filed Jan. 9, 1970, Ser. No. 1,750
Int. Cl. C23c *11/00, 13/00, 17/02*
U.S. Cl. 117—107.2 P 9 Claims



This invention provides a method for producing uniform or nonuniform coatings of aluminum intermetallics on articles consisting of nickel- or cobalt-base alloys, using a reduced pressure pack coating technique in which the coating is derived from an alloy containing at least 40 percent by weight of aluminum.

3,625,751

TRANSPARENT ASTATIC PLASTIC ARTICLES HAVING AMMONIUM SULFONIC ACIDS GROUPS ON THE SURFACE THEREOF AND METHOD FOR THEIR PRODUCTION

Wilhelm E. Walles, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of application Ser. No. 686,715, Nov. 29, 1967, now abandoned. This application Nov. 6, 1968, Ser. No. 773,969
Int. Cl. B44d *5/12;* B32b *27/06*
U.S. Cl. 117—118 6 Claims

A method for the rapid rendering of transparent polymer articles astatic by treating the articles with dilute gaseous sulfur trioxide followed by treatment with ammonia and water or dilute aqueous ammonia. The articles are rendered permanently astatic without affecting their transparency by this process.

3,625,752

PRECURED ADHESIVE TAPE

Ralf Korpman, East Brunswick, N.J., assignor to Johnson & Johnson

Continuation-in-part of application Ser. No. 720,811, Apr. 12, 1968, now abandoned , Continuation-in-part of application Ser. No. 720,955, Apr. 12, 1968, now abandoned. This application Oct. 7, 1969, Ser. No. 864,334
Int. Cl. C09j *7/02*
U.S. Cl. 117—122 P 7 Claims

A precured pressure-sensitive adhesive tape possessing superior high-temperature properties over a wider range of curing conditions than normally employed. This tape is based on a diene adhesive wherein a major proportion by weight of the elastomers is an elastomeric and thermoplastic block polymer of the structure ABA, wherein A is a thermoplastic polymer block of a vinyl arene with a glass transition temperature above normal room temperature and B is an elastomeric polymer block of isoprene. The elastomers are combined with a tackifier and a curing agent, coated on a

backing to form a tape, and then cured in situ to provide a precured adhesive tape having the desired range of high-temperature properties.

3,625,753

FLAME RETARDANT FOR TEXTILES

Samuel James O'Brien, Dunellen, and Robert George Weyker, North Plainfield, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Filed Oct. 14, 1969, Ser. No. 866,402
Int. Cl. C09k *3/28;* D06m *13/26*
U.S. Cl. 117—137 5 Claims

Aqueous solutions of dimethylol dicyandiamide and phosphoric acid useful as durable finishes on cellulosic textile materials to impart flame retardance and the cellulosic textile materials treated therewith.

3,625,754

SURFACE-MODIFIED POLYESTER ARTICLE

Richard L. Dunn, Raleigh, N.C., assignor to Beaunit Corporation, New York, N.Y.

Filed Feb. 2, 1970, Ser. No. 8,072
Int. Cl. B32b *27/08, 27/36*
U.S. Cl. 117—138.8 F 4 Claims

Surface-modified polyester articles are provided having soil-release properties and improved dispersed dyeability comprising a copolyester comprising at least 85 percent by weight of ethylene terephthalate units and about one to 15 percent by weight of ethylene dimerate units, and having cocrystallized on the surface thereof a copolymer comprising at least 40 percent by weight of polyoxyalkylene groups, at least 9.5 percent by weight of ethylene terephthalate units and at least 0.5 percent by weight of ethylene dimerate units. The surface-modified polyester articles are prepared by applying a copolymer comprising polyoxyalkylene groups, ethylene terephthalate units, and ethylene dimerate units to the copolyester comprising ethylene terephthalate units and ethylene dimerate units and subjecting the surface treated copolyester article to a temperature of at least 80° C. for a time sufficient to cause cocrystallization to take place on the surface of the treated copolyester.

3,625,755

SUPPORTED METAL SALT/PHOSPHINE COMPLEXES AND METALLIZED PRODUCTS THEREFROM

Earle M. Potrafke, Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of application Ser. No. 540,517, Apr. 6, 1966, now Patent No. 3,438,805, dated Apr. 15, 1969. This application Apr. 14, 1969, Ser. No. 816,122
Int. Cl. C23c *3/04*
U.S. Cl. 117—160 12 Claims

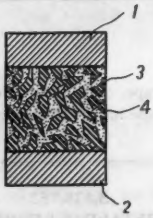
Metal salt/phosphine complexes deposited within and/or on a metallic or nonmetallic support or substrate, said complexes being derived from one mole of a nonorganometallic salt of a normally solid heavy metal of the Deming Periodic Table, for example, gold or palladium chloride, and 1 to 4 moles of a triorganophosphine, for example, a trihydrocarbyl or tridihydrocarbylamino phosphine such as a trialkylphosphine, and metallized metallic and nonmetallic substrates prepared therefrom.

3,625,756

METHOD FOR MAKING A GAS-SENSING ELEMENT

Naoyoshi Taguchi, 1-2 Uemachi Ikeda Nagata-ku, Kobe, Hyogo-ken, Japan

Filed Jan. 21, 1969, Ser. No. 800,798
Int. Cl. G01n *33/00*; H01c *13/00*
U.S. Cl. 117—201 3 Claims



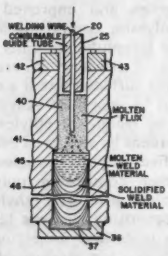
A gas-sensing element including a semiconductor material which changes its electroconductivity when it adsorbs a gas. In manufacture of the element, the semiconductor material is mixed with a material such as stearic acid which evaporates, sublimates or burns away when heated and produces a number of pores therein. When the mixture is applied to a suitable supporting material between a pair of electrodes and then heat-treated, the resultant gas-sensing element has an improved rate of change of electroconductivity.

3,625,757

COATED CONSUMABLE GUIDE TUBE FOR ELECTROSLAG WELDING

Albert Edward Wiehe, and Lowell W. Mott, both of Troy, Ohio, assignors to Hobart Brothers Company, Troy, Ohio

Filed Apr. 23, 1969, Ser. No. 818,722
Int. Cl. B23k *9/18, 35/22*
U.S. Cl. 117—202 10 Claims



A consumable guide tube for use in electroslag welding includes a coating which, when heated, forms a conductive molten flux having a composition such that relatively long welds in confined areas may be made with the physical properties of the resultant weld being substantially constant throughout the length of the weld. The flux contains titanium dioxide, potassium oxide, and sodium oxide.

3,625,758

BASE MATERIAL AND METHOD FOR THE MANUFACTURE OF PRINTED CIRCUITS

Fritz Theodor Stahl, Krefeld; Hedwij Maria Steffen, Geldern, Germany; Frederick W. Schneble, Jr., Oyster Bay, and John F. McCormack, Roslyn Heights, N.Y., assignors to Photocircuits Corporation, Glen Cove, N.Y.

Filed Feb. 21, 1967, Ser. No. 617,502
Claims priority, application Germany, Feb. 22, 1966, P 38829
Int. Cl. H05k *3/10*; C23c *5/00*
U.S. Cl. 117—212 14 Claims

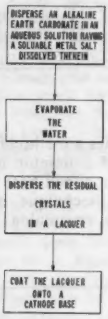
This invention relates to metallizing insulating base materials and more particularly to rendering insulating materials sensitive to electroless metal deposition and then depositing electroless metal on the sensitized material, and to the resulting new and improved metallized articles, including printed circuit boards.

3,625,759

PROCESS FOR MAKING OXIDE CATHODES HAVING IMPROVED THERMAL EMISSIVITY

Paul D. Williams, Portola Valley, Calif., assignor to Varian Associates, Palo Alto, Calif.

Continuation-in-part of application Ser. No. 627,689, Apr. 3, 1967, now abandoned. This application Aug. 27, 1969, Ser. No. 853,452
Int. Cl. H01j *1/14*; H01k *1/04*
U.S. Cl. 117—224 15 Claims


DISPERSE AN ALKALINE EARTH CARBONATE IN AN AQUEOUS SOLUTION HAVING A SOLUABLE METAL SALT DISSOLVED THEREIN
EVAPORATE THE WATER
DISPERSE THE RESIDUAL CRYSTALS IN A LACQUER
COAT THE LACQUER ONTO A CATHODE BASE

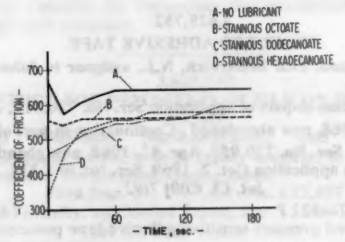
A process for making an oxide cathode having metallic powders finely and evenly interspersed with alkaline earth oxides. An alkaline earth carbonate is dispersed in an aqueous solution having a soluble metal salt dissolved therein. The water is evaporated leaving carbonate crystals coated with the metal salt. The coated crystals are then dispersed in a lacquer which in turn is coated onto a cathode base.

3,625,760

MAGNETIC RECORDING MEDIUM WITH LUBRICANT

Manuel Slovinsky, Woodridge, Ill., assignor to RCA Corporation

Filed Feb. 27, 1970, Ser. No. 14,944
Int. Cl. H01f *10/02*
U.S. Cl. 117—235 7 Claims



A magnetic recording media, such as magnetic tape, includes as a lubricant a stannous salt of an aliphatic acid containing at least eight carbon atoms.

3,625,761

METHOD FOR THE TREATMENT OF ALKALINE EARTH METAL SULFATE SCALE

Jack F. Tate, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,721
Int. Cl. C23g 1/08, 1/20
U.S. Cl. 134—3 3 Claims

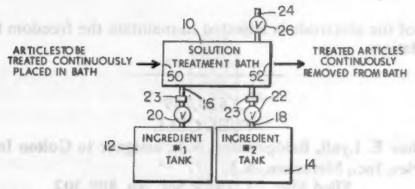
Method for the treatment of alkaline earth metal sulfate scale using sodium ethylenediaminetetraacetate and recovery of the sodium ethylenediaminetetraacetate.

3,625,762

CLEANING SOLUTION AND METHOD AND APPARATUS FOR USING THE SAME

Nick Kappas, 5486 Madison St., Gary, Ind.

Filed July 2, 1969, Ser. No. 838,406
Int. Cl. B08b 3/04
U.S. Cl. 134—10 5 Claims



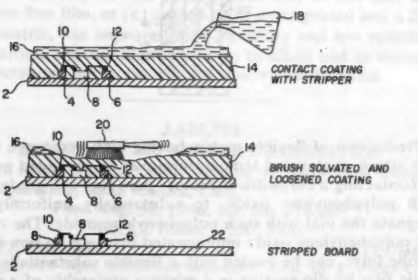
A cleaning solution comprising water, about 2.5 to about 4.0 liquid ounces of a caustic and water solution having a density of about 11.67 pounds per gallon for each gallon of water, and about 1.5 to about 4.0 liquid ounces of a sodium silicate and water solution having a density of about 12.67 pounds per gallon for each gallon of water. The apparatus of the invention includes a bath, two separate tanks separately connected to the bath and having separate valves for independently metering the contents of the tanks into the bath as desired. The bath is preferably stationary and the tanks are preferably portable and easily attached and detached from the bath. A specific tank for use with the bath has a fill opening, a vent and a valve attached to the tank. Articles to be treated by the solution are placed within the solution in accordance with the method of the invention and the concentrations of hydroxide and silicate are periodically determined in a sample of the solution, and both additional caustic solution and the sodium silicate solution are metered into the bath to maintain desired concentration levels.

3,625,763

CONFORMAL COATING STRIPPING METHOD AND COMPOSITION

Manlio B. Melillo, Inglewood, Calif., assignor to The Bunker-Ramo Corporation, Canoga Park, Calif.

Filed Dec. 4, 1968, Ser. No. 780,998
Int. Cl. B08b 7/00; C09d 9/00; C23g 5/02
U.S. Cl. 134—38 8 Claims



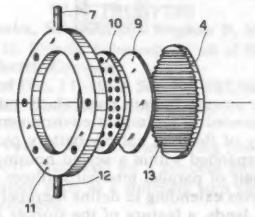
A liquid composition for stripping resin coatings such as epoxy embedment or conformal coatings from substrates such as printed circuit boards. The composition is a substantially anhydrous combination of organic liquids comprising on a volume basis above about 60 percent of a halogenated hydrocarbon liquid, a minor amount below 12 percent but above 4 percent of an alcohol and below 5 percent but at least 1 percent of a ketone. The resin coating is contacted with the composition for a period sufficient to loosen and solvate said resin. The removal of the softened resin may be facilitated by brushing.

3,625,764

ELECTRODE FOR ELECTRIC STORAGE BATTERIES CONTAINING ZINC HALIDE IN AQUEOUS SOLUTION, OF THE TYPE HAVING A SOLUBLE CATHODE AND A DISSOLVED ANODE

Mario DeRossi, Rome, Italy, assignor to Consiglio Nazionale Delle Ricerche, Rome, Italy

Filed Sept. 9, 1969, Ser. No. 856,408
Claims priority, application Italy, Apr. 23, 1969, 36614 A/69
Int. Cl. H01m 35/02
U.S. Cl. 136—22 1 Claim



An electrode for use in zinc halide-halogen cells comprising a graphite mass in electrical contact with a dispersion of powdered graphite and a perchlorate salt of tetramethyl- or tetrabutylammonium is disclosed along with various cell constructions.

3,625,765

PRODUCTION OF BATTERY ELECTRODE

Frank C. Arrance, Costa Mesa, and Albert G. Rosa, Placentia, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

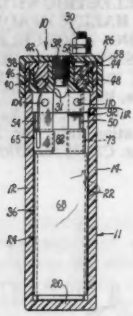
Filed July 22, 1969, Ser. No. 843,610
Int. Cl. H01m 35/06
U.S. Cl. 136—75 8 Claims

Production of a sintered metal matrix which is uniform, and maintains its shape without collapse or distortion, for use particularly as an electrode matrix for a high-rate, high-energy density battery, by a process which comprises, according to one embodiment, dipping a spongelike material such as a polyurethane sponge in a slurry of a plastic binder which decomposes at a higher temperature than the spongelike material, such as polyphenylene oxide, dissolved in a solvent such as chloroform, and containing a sinterable metallic constituent such as a mixture of silver and silver oxide, air-drying the resulting coated spongelike material, heating the dried and coated spongelike material to a temperature causing decomposition of the spongelike material, leaving a matrix of the plastic binder and sinterable metallic constituent, further heating at a higher temperature the latter remaining matrix, causing a partial sintering of the metallic constituent followed by decomposition of the plastic binder, the partially sintered metallic matrix being sufficiently well formed to avoid slumping or distortion of the matrix, and further heating and sintering the remaining matrix to provide a strong porous matrix. The porous matrix itself can be used as an electrode, or the pores of the matrix can be filled with active battery electrode material such as zinc, by suitable means as by application of pressure, to form a high-strength high-capacity electrode for a high-rate high-energy density battery.

3,625,766
ELECTRIC STORAGE BATTERY

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Thomas H. Purcell, Jr., and Alfred W. Jordan, both of Raleigh, N.C.

Filed Nov. 26, 1969, Ser. No. 880,250
Int. Cl. H01m 1/04
U.S. Cl. 136—79 5 Claims



An electric storage battery particularly suited for resisting forces experienced in an impact environment, characterized by a plurality of flexible, narrow battery plates, of opposite polarities, suspended within a sealed housing having therein provided a pair of parallel internal surfaces including a plurality of grooves extending to define therebetween commonly dimensioned lands, a feature of the storage battery being an employment of said grooves for supporting the plates of one polarity along opposed vertical surfaces, while the plates of the other polarity are suspended therebetween in a manner such that the plates of the first polarity serve to impart lateral support to the plates of both polarities in an impact environment.

3,625,767
THERMAL BATTERY

Robert P. Clark, and Kenneth R. Grothaus, both of Albuquerque, N. Mex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Dec. 17, 1969, Ser. No. 885,791
Int. Cl. H01m
U.S. Cl. 136—83 10 Claims

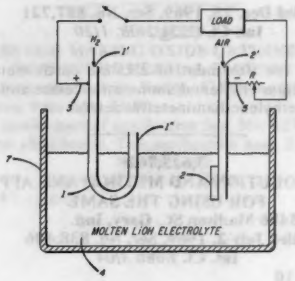
A high-voltage thermal battery capable of miniaturized construction including one or more heat-conductive and electrical-insulative casings having one or more internal passageways, a plurality of electrical battery cells stacked in the casing passageways in electrical series with each cell having alternating layers of cathode-anode electrodes and fusible electrolyte members, and means for generating heat disposed about the casing or casings.

3,625,768
METHOD OF OPERATING FUEL CELL WITH MOLTEN-OXYGEN-CONTAINING ELECTROLYTE AND NON-POROUS HYDROGEN-DIFFUSING NICKEL ELECTRODE

David McLeod Moulton, Route 17, Church View Lane, Knoxville, Tenn., and Walter Juda, 12 Moon Hill Road, Lexington, Mass.

Continuation of application Ser. No. 431,357, Feb. 9, 1965, now Patent No. 3,356,113. This application Aug. 4, 1969, Ser. No. 850,691
Int. Cl. H01m 27/20
U.S. Cl. 136—86 E 5 Claims

Nonporous nickel is used as a hydrogen-diffusion electrode in an elevated-temperature, molten, oxygen-containing electrolyte. Hydrogen ions formed at the electrode-electrolyte interface protect the electrode from oxidation, and the potential of the electrode is adjusted to maintain the freedom from oxidation.



3,625,769
FUEL CELL

Arthur E. Lyall, Bridgewater, N.J., assignor to Gulton Industries, Inc., Metuchen, N.J.

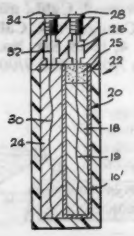
Filed Mar. 21, 1969, Ser. No. 809,302
Int. Cl. H01m 27/00
U.S. Cl. 136—86 A 10 Claims

A room-temperature-operated fuel cell comprising an oxygen electrode, a lithium metal-containing electrode, and an electrolyte comprising an inert, aprotic organic solvent, exemplified by dimethylsulfoxide, which contains an inorganic or organic ionizable salt sufficient in amount to attain saturation. The salt may, or may not, be an oxygen carrier. In those instances where a salt which is not an oxygen carrier is employed, lithium oxide initially is incorporated into the electrolyte.

3,625,770
FLEXIBLE MATRIX AND BATTERY SEPARATOR EMBODYING SAME

Frank C. Arrance, Costa Mesa, and Albert G. Rosa, Placentia, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed June 2, 1969, Ser. No. 829,573
Int. Cl. H01m 3/02
U.S. Cl. 136—145 12 Claims



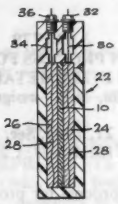
Production of flexible matrix having high resistance to alkali attack at elevated temperature over an extended period, by contacting a chrysotile asbestos (pure fuel cell grade) mat with polyphenylene oxide, to substantially uniformly impregnate the mat with such polyphenylene oxide. The resulting polyphenylene oxide impregnated mat, e.g. in box or envelope form, can be coated with a flexible substantially inorganic film by dip-coating in a mixture preferably of a major portion of an inorganic or cermic separator material, a minor portion of potassium titanate in short fiber form, and a minor portion of an organic polymer, e.g. polyphenylene oxide, dis-

solved in a suitable solvent such as chloroform. The resulting porous chrysotile asbestos separator uniformly impregnated with polyphenylene oxide and having a flexible coating thereon as described above, has low electrical resistivity, is smooth and uniform in thickness, is highly flexible, and has markedly improved resistance to alkali at elevated temperatures over an extended period. When formed into a box, bag or envelope, an electrode such as a zinc electrode, can be inserted into the box or bag-shaped flexible porous battery separator above, and incorporated in a battery in side-by-side relation with other electrodes, such as silver electrodes.

3,625,771
BATTERY SEPARATOR

Frank C. Arrance, Costa Mesa, and Albert G. Rosa, Placentia, both of Calif., assignors to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Mar. 27, 1969, Ser. No. 810,945
Int. Cl. H01m *3/02*
U.S. Cl. 136—145 **24 Claims**



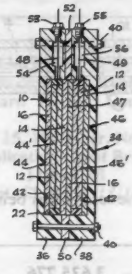
Production of a flexible battery separator, according to one embodiment, by dip-coating an electrode such as a silver or zinc electrode in a mixture of a major portion of an inorganic or ceramic separator material, a minor portion of potassium titanate, and a minor portion of a mixture of organic substances including an organic polymer, e.g., polyphenylene oxide, and a material or ester derived from certain acids such as azelaic acid, e.g., di-isooctyl azelate or polypropylene polyazelate, such mixture of organic substances being dissolved in a suitable solvent such as chloroform. The electrode is placed in the mixture, preferably maintained under vibration, and stirred, the electrode and applied coating are removed from the mixture, and the coating is air-dried to remove solvent and is cured at elevated temperature. Alternatively, such a flexible separator can be formed on any suitable supporting surface, such as glass plate, and the resulting flexible separator stripped from such plate to produce a flexible porous, substantially inorganic separator membrane for incorporation between the electrodes of a battery. Alternatively, a flexible porous substrate or matrix, preferably in the form of a compartment for insertion therein of a battery electrode, can be placed in the above-noted mixture of inorganic material and organic substances, the substrate and applied coating removed from the mixture, and the coating dried to remove solvent and cured at elevated temperature. In each case, the separator film (a) applied directly on the battery electrode, or (b) cast as a flexible free film, or (c) coated on or impregnated into a flexible matrix, has improved high flexibility and low resistivity properties, and has high resistance to alkali and to elevated temperatures, and is smooth and uniform in thickness.

3,625,772
ELECTRODE-SEPARATOR COMBINATION

Albert Himy, Tustin, Calif., assignor to McDonnell Douglas Corporation, Santa Monica, Calif.

Filed Aug. 30, 1966, Ser. No. 576,009
Int. Cl. H01m *17/00, 3/00*
U.S. Cl. 136—100 **12 Claims**

A porous rigid electrode-separator unit of a wafer-type construction. The electrode is sandwiched substantially centrally between two porous rigid inorganic separators of slightly greater size than the electrode so that the separator edges overlap the electrode edges forming a cavity completely around the electrode edges. This cavity is filled with a



filler, preferably a resin, e.g., epoxy, which upon cure bonds the separator edges together and completely seals the electrode within.

3,625,773
METHOD OF PRODUCING BETA-ALUMINA ELECTROLYTES

Richard J. Charles, Schenectady; Stephan P. Mitoff, Elnora, and William G. Morris, Schenectady, all of N.Y., assignors to General Electric Company

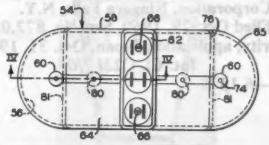
Filed Dec. 17, 1969, Ser. No. 885,961
Int. Cl. H01m *11/00;* **B01k** *3/12*
U.S. Cl. 136—153 **7 Claims**

High-density beta-alumina bodies having low electrical resistivity values are produced by a process including a consolidation operation such as a sintering step carried out in a dry oxygen atmosphere.

3,625,774
BATTERY-MOUNTED RECEPTACLE MEANS

Lawrence E. Rodgers, 5618 Second Ave., Pittsburgh, Pa.

Filed Apr. 27, 1970, Ser. No. 32,309
Int. Cl. H01m *1/00;* **H01r** *11/00*
U.S. Cl. 136—181 **5 Claims**



I disclose a receptacle arrangement for mounting on a battery, said arrangement comprising an insulating support, receptacle means mounted on said support, conductors mounted on said support and electrically connected to said receptacle means, said conductors being disposed for electrical engagement with terminals respectively of said battery, and cooperating means on said support and on said battery terminals for securing said support to said terminals at a position of electrical engagement of said conductors with said terminals respectively.

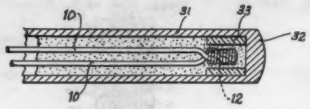
3,625,775
REINFORCED THERMOCOUPLE JUNCTION

Douglas J. MacKenzie, Park Ridge; Frank Accettura, Elmwood Park, and Peter F. Hansen, Niles, all of Ill., assignors to American Standard, Inc., New York, N.Y.

Filed Dec. 29, 1967, Ser. No. 732,788
Int. Cl. H01v *1/04*
U.S. Cl. 136—233 **3 Claims**

A thermocouple junction comprising at least two wires in twisted or side-by-side relation, the junction being reinforced

against failure by embrittlement by another wire or ribbon wound thereover, the several wires being anchored at a common point by fusion.



3,625,776

PREPASSIVATION-COLOR METHOD FOR DETECTING CRACKS IN METAL BODIES

Michael F. Henry, Schenectady, N.Y., assignor to General Electric Company

Filed Dec. 31, 1969, Ser. No. 889,694
Int. Cl. C23f 5/02; G01n 31/00
U.S. Cl. 148—6.14 12 Claims

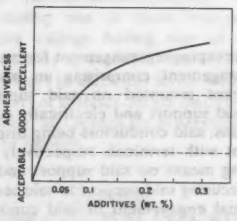
A nondestructive color method for detecting cracks in a metal body by selective corrosion of the surface portion within the cracks which includes prepassivation of the surface being tested to substantially reduce background indications. Specifically, a passivating solution is applied to the surface of the metal body to be tested and removed therefrom after a period of time sufficient to passivate its open surface portion but insufficient to significantly passivate the surface portion contained within cracks therein. A color-forming aqueous acid indicating solution is then applied to the thus passivated surface area. The indicating solution contains halide ions and a color-forming indicator and is formulated so that it does not corrode the open surface portion of the metal body but is sufficiently reactive to corrode the surface portion within cracks therein resulting in the formation of metallic ions. The color-forming indicator is of the type which reacts with the thus-formed metal ions to form a distinctive colored compound at the crack locations.

3,625,777

PROCESS FOR PHOSPHATE CONVERSION COATING

Masanaga Okabe; Kakuro Muro; Masamichi Iizuka, and Sumio Sakata, all of Tokyo, Japan, assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,022
Claims priority, application Japan, Oct. 31, 1968, 43/78918
Int. Cl. C23f 7/08
U.S. Cl. 148—6.15 Z 6 Claims



An improvement in the process of phosphate conversion coating on the surface of metals such as iron, steel, zinc or its alloy being characterized in that at least one carbohydrate selected from the group consisting of starch, starch derivatives and polysaccharides produced by acid decomposition of starch or starch derivatives, is added into ordinary acid zinc phosphate conversion coating solution, wherein a fine and dense zinc-phosphate-coating film can be obtained, and thereby improving paint bonding quality of the coating when the paint is applied to said coating and corrosion resistance of the coated metals.

3,625,778

HEAT-TREATING ALUMINUM SILICON ALLOY

Clarence L Hildreth, Baton Rouge, and Sebastian M. Laurent, Greenwell Springs, both of La., assignors to Ethyl Corporation, New York, N.Y.

Filed June 3, 1970, Ser. No. 43,229
Int. Cl. C22f 1/04
U.S. Cl. 148—13 9 Claims

A method for increasing the amount of free aluminum in an aluminum-silicon-alloy-containing iron and titanium as impurities which comprises heating the alloy to a temperature of from about 400° C. to about 1,200° C. for at least 2 hours sufficient to decrease the amount of aluminum chemically bound in the form of intermetallic compounds.

3,625,779

REDUCTION-FUSION PROCESS FOR THE PRODUCTION OF RARE EARTH INTERMETALLIC COMPOUNDS

Robert E. Cech, Scotia, N.Y., assignor to General Electric Company

Filed Aug. 21, 1969, Ser. No. 852,100
Int. Cl. H01f 1/04; C22b 59/00
U.S. Cl. 148—101 5 Claims

A reduction-fusion process for producing novel rare earth intermetallic compounds, for example, cobalt rare earth intermetallic compounds, especially compounds useful in preparing permanent magnets. A particular mixture of rare earth metal oxide and calcium hydride is heated to affect reduction of the rare earth metal oxide. The resulting rare earth metal-containing mixture is fused with cobalt or other ferromagnetic metal to form the rare earth intermetallic compound and allowed to solidify. The solid is pulverized and then treated to recover the rare earth intermetallic compound.

3,625,780

PROCESS FOR PREPARATION OF HIGH-STRENGTH ALLOY OF TITANIUM AND FERRITIC STRUCTURE

Richard A. Bosch, and John A. Straatmann, both of Poland, Ohio, assignors to The Youngstown Sheet and Tube Company, Youngstown, Ohio

Filed Apr. 29, 1968, Ser. No. 725,136
Int. Cl. C21d 7/14, 9/46
U.S. Cl. 148—134 10 Claims

Low-alloy high-strength titanium steel and a process for preparing said steel by solution heat treating and thereafter controlling the cooling rate to the precipitation-hardening temperature range required to produce a steel characterized by a yield strength in the range of 60,000 to 120,000 p.s.i.

3,625,781

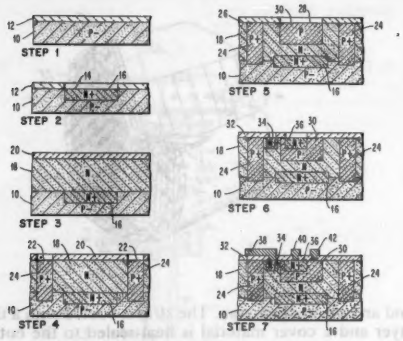
METHOD OF REDUCING CARRIER LIFETIME IN SEMICONDUCTOR STRUCTURES

Madhukar L. Joshi, Essex Junction, Vt.; Burton J. Masters, Poughkeepsie, N.Y.; Osvaldo R. Viva, Williston, Vt., and Tsu-Hsing Yeh, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 9, 1969, Ser. No. 823,255
Int. Cl. H01l 7/44
U.S. Cl. 148—189 18 Claims

A method of fabricating high-speed planar transistor structures by reducing carrier lifetime through doping with carrier lifetime killers. Gold is diffused through the front surface of the silicon structure during transistor fabrication. The gold is introduced from the vapor phase in a controlled manner so that its solid solubility in silicon is not exceeded. A simultaneous gold and base diffusion is preferred.

Such a simultaneous diffusion produces a novel planar transistor structure having a gold distribution curve with an unexpected increased concentration peak in the region proximate to the base-collector junction.



3,625,782

SOLID PROPELLANTS CONTAINING BURNING RATE DEPRESSANTS

Adolf E. Oberth, Fair Oaks, and Rolf S. Bruenner, Orangevale, both of Calif., assignors to Aerojet-General Corporation, El Monte, Calif.

Filed May 2, 1968, Ser. No. 726,649
Int. Cl. C06d *5/06*
U.S. Cl. 149—19 **12 Claims**

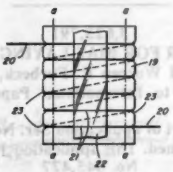
This patent described novel solid ammonium perchlorate containing propellant compositions containing powerful burning-rate depressants which are potential bases, that is, compounds which are capable of releasing free bases. The burning-rate depressants of this invention do not reduce the specific impulse of the propellant, nor do they interfere with cure reactions or adversely affect the physical properties of the cured propellant.

3,625,783

SIMULTANEOUS BONDING OF MULTIPLE WORKPIECES

Alexander Coucoulas, Bridgewater Township, Somerset County, N.J., assignor to Western Electric Company, Incorporated, New York, N.Y.

Filed May 7, 1969, Ser. No. 822,428
Int. Cl. B29c *27/08;* **B65c** *9/04;* **B23k** *31/02*
U.S. Cl. 156—73 **16 Claims**



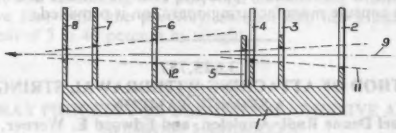
Methods and apparatus for simultaneously bonding a plurality of first workpieces to spaced-apart locations on at least one second workpiece. The invention is particularly suited for simultaneously bonding a plurality of lead wires to the terminal land areas of an integrated circuit or other electronic device. A deformable, compliant support member is spirally wound with a continuous metallic filament. After the spiral has been formed it is secured to the support member by any suitable adhesive means. The edges of the support member are sheared to cut the spiral windings and thus form a plurality of lead wires. The indentations which are formed on the reverse side of the support member when the spiral is cut may be used for alignment purposes. Thermal and/or mechanical bonding energy applied through the support member bonds the plurality of lead wires to the integrated circuit.

3,625,784

METHOD OF MAKING A TUBULAR MEMBER

Bernard Edwin Ash, Bexleyheath, Kent, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Feb. 25, 1969, Ser. No. 802,087
Claims priority, application Great Britain, Mar. 7, 1968, 11,049/68
Int. Cl. H01b *13/10*
U.S. Cl. 156—54 **6 Claims**



A flexible strip of material is formed into a spiral shape having two overlapping layers by passing a flat strip through a series of apertured elements having particular shaped tapered passageways and slots. The layers may be applied as insulation for conductors.

3,625,785

METHOD OF PRODUCING A MECHANICALLY STIFF GASTIGHT PACKAGING CONTAINER

Sven Nils Hakan Holmstrom, Loberod, and Jan-Erik Olsen, Lund, both of Sweden, assignors to AB Tetra Pak, Lund, Sweden

Filed Mar. 6, 1969, Ser. No. 804,900
Claims priority, application Sweden, Apr. 4, 1968, 4804
Int. Cl. B29c *27/02*
U.S. Cl. 156—69 **1 Claim**

A method for sealing containers made of foam plastic and having a homogeneous thermoplastic lining, the top edge of the lining being initially located below the top edge of the foam plastic container, in which a lid having a thermoplastic under surface is applied to the container and pressed and heated so as to melt the top edge of the foam plastic container so that the lid can be pressed down until the thermoplastic under surface of the lid contacts and seals with the top edge of the thermoplastic lining of the container.

3,625,786

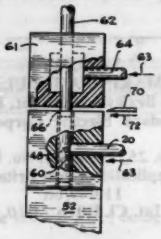
IMPLANT CAPSULE AND APPARATUS AND METHOD FOR MAKING SAME

Whitney Lombard Pearson, Lake Bluff; John Alexander Banford, Lake Bluff, and Earl Thaddeus Szymanski, Chicago, all of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Oct. 2, 1969, Ser. No. 864,949
Int. Cl. B29c *27/02;* **B65b** *7/28*
U.S. Cl. 156—69 **6 Claims**

A tubular capsule is sealed by forcing the tip of a rod into

the end of the capsule cavity, preferably while the volume of



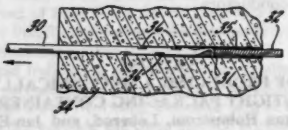
the capsule is reduced. Apparatus suitable for use in a multistation capsule manufacturing operation is provided.

3,625,787

METHOD OF ATTACHING WITHDRAWAL STRING TO A SPONGE TAMPON

Michael Deane Radl, Appleton, and Edward E. Werner, Oshkosh, both of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Filed Aug. 11, 1969, Ser. No. 849,119
Int. Cl. B29c *27/08*; A61f *13/20*
U.S. Cl. 156—73 5 Claims



A method for economically and efficiently securing a withdrawal string to a regenerated cellulose sponge tampon in the manufacture of menstrual tampons. A string which includes a heat-reactive adhesive element is inserted into a sponge tampon, and sonic energy is then applied to the tampon to provide a rapid and highly localized heating of the adhesive element, causing it to flow into intimate contact with the surrounding sponge material and form a secure bond between the string and sponge when cooled. The disclosure alternatively shows a means for simultaneously applying an adhesive substance to a string as it is being drawn into a sponge tampon so that an adhesive coating is applied only to the portion of the string contained within the tampon.

3,625,788

METHOD OF MANUFACTURING A UNITARY COMPOSITE ARTICLE COMPRISED OF A CORE AND LINING

Bernard I. Bartner, 229-07 58th Ave., Bayside, N.Y.

Continuation-in-part of application Ser. No. 631,652, Apr. 18, 1967. This application Sept. 4, 1969, Ser. No. 860,150
Int. Cl. B32b *5/18*
U.S. Cl. 156—78 10 Claims

A method of manufacturing a writing implement having an inner body portion of unfoamed resin. The method consists of inserting a heated probe into the inner body portion so as to cause the foamed resin to become molten, withdrawing the probe and simultaneously inserting a writing core into the cavity, and allowing the body to cool whereby foamed resin adheres and bonds to the writing core.

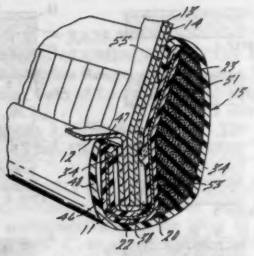
3,625,789

ROOF RAIL PAD AND METHOD OF CONSTRUCTION

Richard E. Gerhardt, Birmingham, Mich., assignor to Microdot Inc.

Filed Aug. 1, 1969, Ser. No. 846,815
Int. Cl. B32b *5/18*; E04c *2/38*; E04f *19/02*
U.S. Cl. 156—79 4 Claims

The roof rail pad is constructed to be applied to a pair of welded flanges by having a U-shaped section moved upwardly thereover and locked thereon by inwardly projecting toothlike ends. A metal carrier strip has fingers cut from the outer edges in continuous relation and formed into a channel



and an extending section. The strip is coated with a thin vinyl layer and a cover material is heat-sealed to the bottom and ends of the sections. A foamed material forms a pad under the cover material on one side of the strip.

3,625,790

PROCESS FOR MAKING GLOVES

Weldon R. Ayres, R.F.D. #1, Willard, Ohio

Filed June 26, 1969, Ser. No. 836,801
Int. Cl. B32b *7/08*
U.S. Cl. 156—93 11 Claims

The glove-making process includes forming a laminate from an elastic fabric and a layer of thermoplastic material, superimposing two of the laminates with the plastic layers adjacent, securing the layers of laminates together in areas thereof to form glove shells therefrom and severing such glove shells from the laminates, heating the glove shells, stretching the glove shells onto a glove form to shape the shells to individual right or left glove shapes, and heating and cooling to complete the glove.

3,625,791

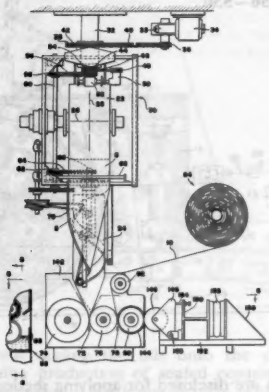
MOISTENER FOR BIAS-LAYING MACHINE

Charles A. Lee, and Warren R. Furbeck, both of Knoxville, Tenn., assignors to International Paper Company, New York, N.Y.

Continuation-in-part of application Ser. No. 719,986, Apr. 9, 1969, now abandoned. This application July 28, 1969, Ser. No. 845,477
Int. Cl. B65h *81/06*
U.S. Cl. 156—194 6 Claims

A continuous cohesive multi-ply ribbon is made by forming a continuous spiral wound tube of creped tissue, flattening the tube and joining the plies of the flattened tube by embossing the plate together. After the spiral wound tube is formed, it is passed through a pressure nip formed by two rolls, thereby flattening the tube. Droplets of water are sprayed on one of the rolls. The water is carried to the pressure nip on the one roll and there transferred to the flattened tube as it enters the pressure nip. The moistened flattened tube is then passed through an embossing nip where the plies of the tube are pressed together at spaced locations with pressure sufficient to crush the fibers of the respective plies

into one another, the water thus added to the creped tissue being sufficient for the crushing of the fibers to attach the



plies together at said spaced locations with a glassine-type attachment.

3,625,792

FABRICATING GLASS-PLASTIC WINDOWS

Paul E. Shaffer, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Apr. 27, 1970, Ser. No. 32,419
Int. Cl. B32b *17/06*
U.S. Cl. 156—212 **15 Claims**

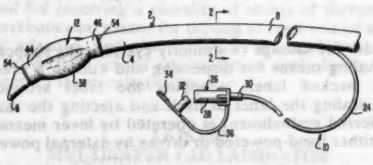
A technique for fabricating unbalanced, transparent, glass-plastic windows incorporating a technique to compensate for distortion effects similar to the action of a bimetal during the time-temperature-pressure cycle involved in lamination.

3,625,793

BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE

David S. Sheridan, Hook Road, Argyle, N.Y., and Isaac S. Jackson, Greenwich, N.Y., assignors to David S. Sheridan, Argyle, N.Y.

Filed Sept. 23, 1969, Ser. No. 860,278
Int. Cl. B32b *31/00*
U.S. Cl. 156—229 **9 Claims**



Disposable balloon-type catheters are made from tubes of extruded waterproof plastic having a major lumen and at least one secondary lumen within the tube wall. Such secondary lumens are joined for fluid flow to inflation tubes by a series of cutting and cementing steps and to elastic inflatable balloons which are fitted in special fashion to the distal end of the tube.

3,625,794

METHOD OF PREPARING LAMINATED FILMS WHILE REGULATING MOISTURE CONTENT

Shoichi Arikawa; Kouichi Hujiwara; Kyoichiro Ikari, and Yukio Nishimatsu, all of Kurashiki, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed July 15, 1969, Ser. No. 841,698
Claims priority, application Japan, July 17, 1968, 43/50335
Int. Cl. B29c *19/00*
U.S. Cl. 156—244 **4 Claims**

Laminated films are produced by conditioning a melt of a polyvinyl alcohol resin to a moisture content of 20 to 60 percent by weight and a temperature between 50° C. and 160° C., extruding said conditioned melt in the form of a thin film through a slit onto the surface of a roller, the roller surface temperature being adjusted to between room temperature and 100° C., passing the resulting film over at least one hot roller, and laminating said polyvinyl alcohol film with a protective film while the polyvinyl alcohol film has a moisture content of 5 to 40 percent by weight.

3,625,795

SPRAY PROCESS FOR DEPOSITING ADHESIVE AND BONDING LAMINATES

Donald P. Knechtges, Middleburg Heights, and Andrew N. Mayak, Elyria, both of Ohio, assignors to The B. F. Goodrich Company, New York, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,946
Int. Cl. B32b *7/14*; **B05c** *3/20*
U.S. Cl. 156—291 **11 Claims**

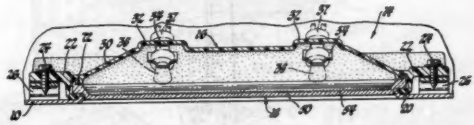
A spray process for the deposition of carboxyl-containing adhesive latices as discrete droplets wherein the droplets are maintained as raised, spaced deposits on the substrate for lamination is provided. The adhesive latex is sprayed at a low viscosity but prior to contact with the substrate the viscosity of the latex droplets is increased so that upon striking the substrate the droplets remain as raised, spaced deposits rather than coalescing to form a continuous adhesive layer or being absorbed by the substrate. Laminates obtained with the present spray process have increased resistance to delamination, good flexibility and hand.

3,625,796

METHOD OF MAKING A MOTOR VEHICLE LAMP ASSEMBLY

George H. Graves, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1969, Ser. No. 858,046
Int. Cl. B29c *19/00*
U.S. Cl. 156—293 **3 Claims**



A motor vehicle lamp assembly includes a plastic lens having a rearwardly extending peripheral lip which is received within a forwardly opening channel formed in a lamp housing. The channel is filled with an initially liquified thermoplastic resin which solidifies upon cooling to establish a strain-free, watertight joint between the lens and the lamp housing.

3,625,797

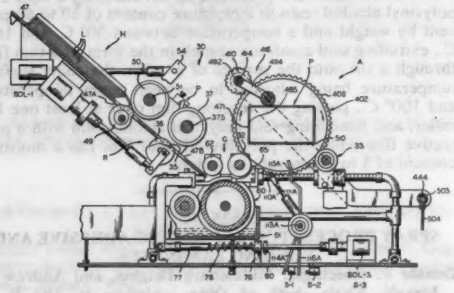
LABELING MACHINE ATTACHMENT FOR APPLYING LABELS TO POLYGONAL CONTAINERS

John G. Wesley, 3118 South Wisconsin Ave., Berwyn, Ill.

Continuation of application Ser. No. 602,296, Dec. 16, 1966, now abandoned. This application Jan. 9, 1970, Ser. No. 1,596
Int. Cl. B65c *9/30*, *3/12*
U.S. Cl. 156—446 **7 Claims**

An attachment for application to round container labeling machines of the type shown in U.S. Pat. No. 3,278,359,

which is in the form of a swing lever assembly adapted to be pivotally mounted on the machine adjacent its round container support rollers, with the swing lever assembly being pivotally mounted about an axis paralleling such support rollers, in which the assembly carries a pair of spaced-apart spin wheels positioned to be lowered into engagement with the support rollers for actuation thereby. The spin wheels are

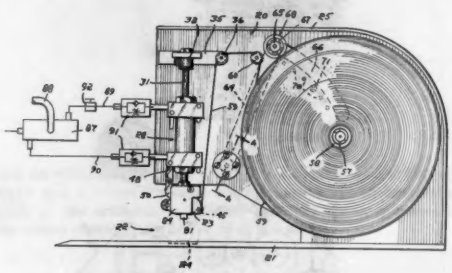


adapted to mount a polygonal-shaped container between them by engaging the ends of same, and a pressure roller carried by the assembly rides on the container to hold the label in place as it is applied thereto on actuation of the label-feeding mechanism of the basic machine, which actuation occurs when the spin wheels engage the support rollers and the rotating container grips a trip switch.

3,625,798
TAPING TOOL
Vincent V. Ihli, 1347 Peterson St., Long Beach, Calif.
Filed Dec. 30, 1969, Ser. No. 889,193
Int. Cl. B44c *7/02*
U.S. Cl. 156—523 **4 Claims**

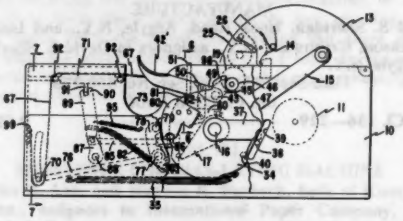
A device and method of using the same to apply tape of a desired length to a generally flat surface, said tape prior to application being spiral wound on a reel, and the exposed surface of the bonding material on the tape, commonly referred to as mud in the trade, covered with a thin, pliable, reusable film of a plastic material that lightly adheres thereto. The film serves the dual function of preventing the bonding material from drying prior to application of the tape to said surface, and the spiral wound layers of the tape from adhering to one another. In addition, an apparatus is disclosed for forming the tape, as well as a protective package in which it may be retailed.

3,625,799
DEVICE FOR DISPENSING AND APPLYING LENGTHS OF ADHESIVE TAPE
David G. Way, Boxborough, Mass., assignor to Tapeler Corporation, Newton, Mass.
Filed Aug. 28, 1969, Ser. No. 853,838
Int. Cl. B32b *31/00*
U.S. Cl. 156—530 **33 Claims**



Devices are disclosed for applying sections of tape from a roll of tape with the tape trained about a polygonal feed block rotatably supported by a carriage under the control of means to reciprocate it between a first position and a second or tape section applying position. The device includes means turning the feed block and cutting the tape thereon to provide a severed section, neither operation being effected on movement of the carriage from the first to the second position. Carriage reciprocation is effected by various power operated means and such may include stroke adjustments and controls for varying the action of the power-operated means. Means are also disclosed enabling the spacing of the carriage relative to the work to be varied. Stripping means are also included when the tape has an interliner.

3,625,800
SAUSAGE BANDER
Lyle L. Hendrix, Carthage, S. Dak.
Filed Oct. 31, 1969, Ser. No. 872,888
Int. Cl. B65c *3/04*; B32b *31/18*
U.S. Cl. 156—540 **6 Claims**

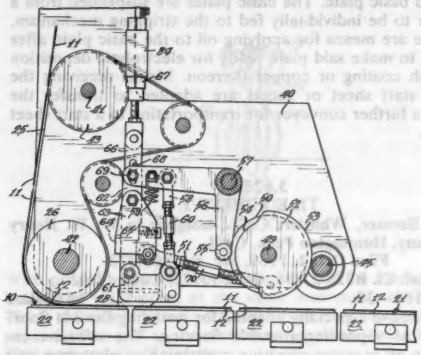


A bander for sausage or similarly cylindrically shaped articles including means for dispensing and cutting a pressure-adhesive backed label, wrapping the label around the sausage, sealing the label to itself and ejecting the sausage. The preferred embodiment is operated by lever means, and may be either hand-powered or driven by external power.

3,625,801
LID APPLICATOR
Archie J. Reed, and August W. McKale, both of Battle Creek, Mich., assignors to Kellogg Company, Battle Creek, Mich.
Filed Dec. 3, 1969, Ser. No. 881,814
Int. Cl. B65b *57/02*; B32b *31/20*
U.S. Cl. 156—542 **15 Claims**

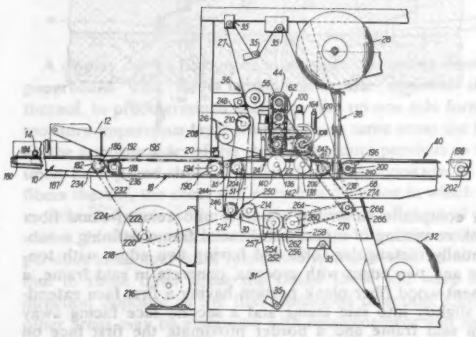
Method and apparatus for applying heat-sealable lids to containers characterized by the steps of and means for feed-

ing a strip of lids to a row of containers, separating the individual lids from the strip and laying a lid on each container, pressing each lid to its container and spot tacking it thereto,



and thereafter heat sealing the lids onto the containers whereby to expedite production of sealed containers; said tacking means comprising a particular feature of this invention.

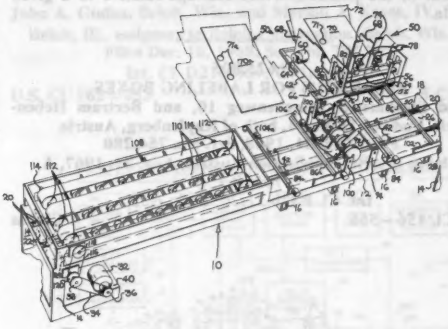
3,625,802
PACKAGING APPARATUS
Jack C. Schniepp, Richmond, Va., assignor to AMP Incorporated
Filed Nov. 25, 1969, Ser. No. 879,768
Int. Cl. B32b *31/08, 31/20*
U.S. Cl. 156—546 **4 Claims**



Sealing apparatus which comprises a pair of rollers mounted for receiving a plurality of sheets of thermoplastic film therebetween, means for driving at least one of said rollers to advance said thermoplastic sheets therepast, and means for heating one of said rollers to apply fusing heat to said sheets of thermoplastic film.

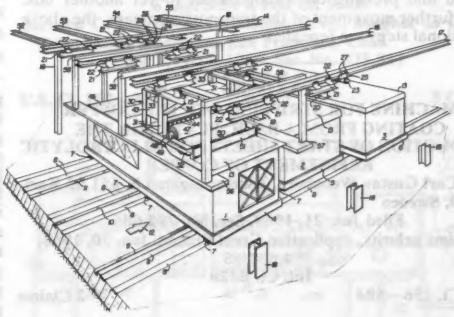
3,625,803
MULTILAYER PAD LAMINATOR
Leonard J. Masulis, Perrysburg, and Richard A. Morrette, Holland, both of Ohio, assignors to Owens-Illinois, Inc.
Filed Sept. 29, 1969, Ser. No. 861,864
Int. Cl. B32b *31/04;* **G05b** *6/02*
U.S. Cl. 156—563 **4 Claims**

Apparatus designed to build up a multilayered pad by laminating a plurality of separate sheets or boards as the sheets are conveyed through the apparatus. A plurality of magazines are supported adjacent a conveyor and each is operable to feed individual die cut corrugated sheets one-at-a-time onto the conveyor. The conveyor includes an elongated support surface having a pair of laterally spaced, longitudinally extending slots formed therein, with the individual sheets being conveyed along the surface by one of a plurality of pairs of tapered pins which project upwardly through the spaced slots above the support surface. Each of the sheets to



be laminated is formed with a pair of spaced openings for telescopingly receiving a pair of the conveyor pins to accurately position the sheet on the conveyor surface and to move the sheet along the support surface by means of a chain which moves the conveyor pins. These conveyor pins provide the means for aligning and registering the various sheets as they are laminated into a multilayer pad.

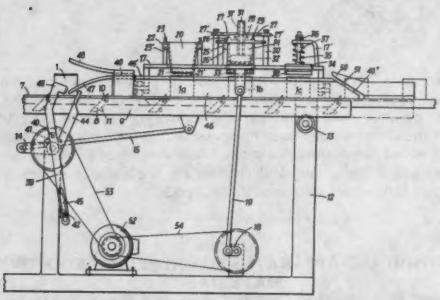
3,625,804
METHOD AND APPARATUS FOR APPLYING ROOFING MATERIAL
Wendell E. Losey, Lauderdale Lakes, and Evans T. Morton, Pompano Beach, both of Fla., assignors to Behring Corporation, Ft. Lauderdale, Fla.
Filed Jan. 9, 1970, Ser. No. 1,767
Int. Cl. E04f *13/20;* **B44c** *7/02*
U.S. Cl. 156—575 **10 Claims**



Apparatus for applying roofing membrane material to modules for homes, apartments or the like, in which an applicator for dispensing adhesive and a roll of roofing membrane material are mounted on a carriage suspended from an overhead track and runway system which provides for movement of the carriage in four directions to allow the carriage to traverse the roof of a module and also to be adjusted from one module to another. In a preferred embodiment, the modules are movable along a path relative to a roofing station, and overhead tracks are supported above the path and parallel to it. Floating runways extend transversely of the tracks and the path. The carriage is movably suspended from the floating runways for movement in two directions transversely of the module transport path so that the carriage with

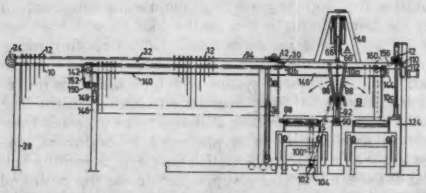
its adhesive applicator and roofing membrane material can traverse the entire length of a module to simultaneously apply adhesive and membrane material to the entire roof of the module. The floating runways, in turn, are movably suspended from the overhead tracks to provide for movement of the floating runways and carriage together in two directions parallel to the module transport path to permit shifting of the carriage from one module to another and adjustment of the position of the carriage relative to a given module.

3,625,805
APPARATUS FOR LABELING BOXES
Harald Strohmeier, Potschenweg 10, and Bertram Hebenstreit, Ludweg Tullerg 4, both of Kapfenberg, Austria
Filed Aug. 21, 1968, Ser. No. 754,280
Claims priority, application Austria, Aug. 21, 1967, A 7635/67
Int. Cl. B32b *31/20;* **B65c** *1/02*
U.S. Cl. 156—565 **4 Claims**



Apparatus for labeling closable boxes for welding electrodes including transporting means movable stepwise for moving the boxes into operative relationship with respect to an adhesive container, a label supply, and a pressing unit. The arrangement is such that upon cessation of movement of the transporting means, adhesive is applied to one box, a label to another box to which adhesive had previously been applied and pressing the applied label to yet another box. Upon further movement of the transporting means, the above operational steps are repeated.

3,625,806
MACHINE FOR STRIPPING OFF THE COPPER COATING FROM A BASIC PLATE FOR THE PRODUCTION OF START SHEETS FOR ELECTROLYTIC REFINEMENT OF COPPER
Olov Carl Gustav Wennberg, Bjurbacksgatan 8, 651 05 Karlstad, Sweden
Filed Jan. 21, 1969, Ser. No. 792,686
Claims priority, application Great Britain, Jan. 30, 1968, 4,680/68
Int. Cl. B32b
U.S. Cl. 156—584 **2 Claims**

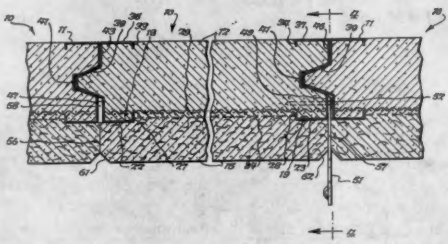


A machine for stripping off the copper coating from a basic plate for the production of start sheets for electrolytic refinement of copper comprises a stripping mechanism which may include one or two reciprocating knives guided to have the edge or edges thereof moved along the side or sides of the basic plate to remove continuous pieces of sheet metal from said basic plate. The basic plates are suspended from a conveyor to be individually fed to the stripping mechanism, and there are means for applying oil to the basic plate after stripping to make said plate ready for electrolytic deposition of a fresh coating or copper thereon. Means receiving the stripped start sheet or sheets are adapted to transfer the latter to a further conveyor for transportation to a start sheet machine.

3,625,807
TILE ADHESIVE
Paul H. Beemer, Whittier, Calif., assignor to W. W. Henry Company, Huntington Park, Calif.
Filed Oct. 2, 1969, Ser. No. 863,373
Int. Cl. B32b *27/28;* **C08c** *13/02;* **C08d** *11/02*
U.S. Cl. 161—38 **14 Claims**

An adhesive especially adapted for installing flexible flooring tiles to vapor-impermeable flooring. The adhesive includes an oil-in-water emulsion containing an elastomer and an air drying tackifying resin in the oil phase and a protective colloid and an emulsifying agent in the water phase.

3,625,808
COMPOSITE CONCRETE AND CEMENT-WOOD FIBER PLANK
Charles A. Martin, Williamsville, N.Y., assignor to Martin Fireproofing Corporation, Buffalo, N.Y.
Filed Sept. 29, 1969, Ser. No. 861,820
Int. Cl. B32b *3/10, 3/02*
U.S. Cl. 161—37 **9 Claims**



A composite laminated concrete and cement-wood fiber plank consisting of a peripheral metal frame defining a substantially rectangular solid and having two edges with tongues and two edges with grooves, concrete in said frame, a cement-wood fiber plank portion having a first face extending slightly into said frame and a second face facing away from said frame and a border proximate the first face on which said frame rests, said concrete penetrating voids in the cement-wood fiber plank portion to effect a bond between the concrete and the cement-wood fiber portion, with the portion of the metal frame adjacent the cement-wood fiber plank portion being of a slightly smaller perimeter than the perimeter of the cement-wood fiber plank portion and the perimeter of the portion of the frame above the tongues and the grooves.

3,625,809
FILAMENT BLEND PRODUCTS
Remus F. Caroselli, Cumberland, and Fred A. Mennerich, Cumberland Hill, both of R.I., assignors to Owens-Corning Fiberglas Corporation
Continuation-in-part of application Ser. No. 529,516, Feb. 23, 1966, now abandoned. This application Feb. 24, 1970, Ser. No. 14,727
Int. Cl. B32b *5/04*
U.S. Cl. 161—91 **7 Claims**

Composite yarns comprising relatively inextensible, but high-strength glass filaments helically overwrapped about a

core of shorter, more straight organic resin filaments which have a substantial amount of stretch, such as rayon and nylon. When tensile force is applied, the glass filaments straighten out and the organic filaments tend to overwrap.

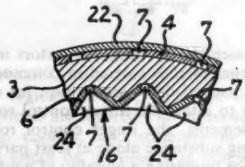
With proper selection, both filaments will be loaded to just below the yield point at the same maximum tensile force. Thus, the combination yarn will break at a load that is approximately equal to the combined breaking strengths of the glass and organic filaments.

3,625,810

DISPLAY LAMINATE

William M. Swartz, 195 Ivy Lane, Highland Park, Ill.

Filed May 28, 1970, Ser. No. 41,244
Int. Cl. B32b *3/10*
U.S. Cl. 161—119 **6 Claims**



A display device comprises a moisture-containing sheet of paperboard with films laminated to the opposite sides thereof. In predetermined areas the film on one side forms a moisture impervious layer while at those same areas the film on the opposite sides of the sheet is moisture pervious so that upon flexing and drying of the sheet and shrinkage of the fibers thereof, the sheet will warp in a direction in which the moisture impervious film is on the outside of a flexure of curvature. In other predetermined areas the films are moisture pervious and impervious, respectively, in a reverse fashion so that in those other areas the flexed sheet will warp in a direction opposite to the first-mentioned direction. Certain other areas may be embossed with reinforcement and made water impervious at both films to inhibit warpage. The foregoing are utilized to enhance the shape of a three-dimensional display in a programmed manner.

3,625,811

METHOD OF PREPARING YARN AND THE LIKE FROM ANIMAL HIDE

Hiroshi Okamura, Tokyo, Japan, assignor to Hisao Sato, Tokyo, Japan and Kabushiki Kaisha Fujita Shohten, Tokyo, Japan

Filed Jan. 19, 1968, Ser. No. 699,031
Int. Cl. D01c *3/00*
U.S. Cl. 162—2 **9 Claims**

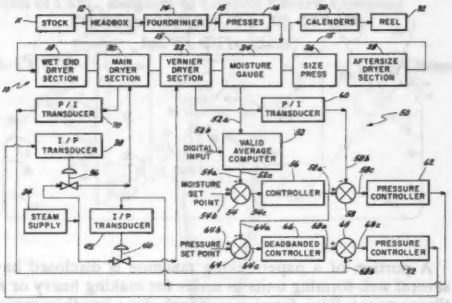
Collagen fiber is obtained from limed animal hide by a process which involves reliming, treating with an enzyme, and finally, beating to loosen the fiber structure of the hide. The fiber structure is then opened mechanically to obtain collagen fiber. The collagen fiber obtained is readily spun into yarn or string. Either the collagen fiber or the spun collagen yarn or string is treated with modifying agents such as tanning agents to improve its characteristics. The collagen yarn and string may be used for a large variety of knitted and woven products.

3,625,812

PRESIZE MOISTURE CONTROL SYSTEM FOR A PAPERMAKING MACHINE

John A. Gudaz, Beloit, Wis., and Marion A. Keyes, IV, South Beloit, Ill., assignors to Beloit Corporation, Beloit, Wis.

Filed Dec. 18, 1968, Ser. No. 784,702
Int. Cl. D21f *5/04;* **G01m** *23/16*
U.S. Cl. 162—253 **5 Claims**



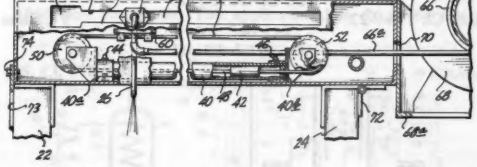
A vernier dryer section normally provides sufficient heat so as to maintain the moisture content of the paper web within a relatively narrow range as it enters the size press. When the vernier dryer section fails, or starts to fail, to maintain the prescribed moisture limits, another dryer section of larger capacity is thermally adjusted so that the moisture content of the web is closely controlled and in this way held within the specified limits.

3,625,813

POWER-OPERATED CUTTER FOR FORMING LEAD STRIPS IN A PAPER WEB

Bernard C. Eckelman, Clatskanie, Oreg., assignor to Crown Zellerbach Corporation, San Francisco, Calif.

Filed May 19, 1969, Ser. No. 825,811
Int. Cl. B31f *5/00*
U.S. Cl. 162—286 **5 Claims**



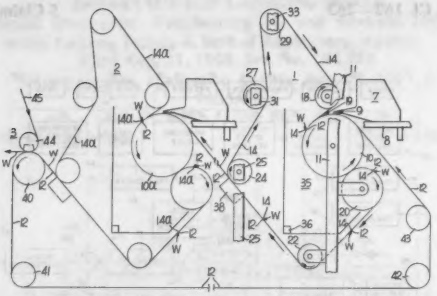
A power-operated cutter for cutting paper web being prepared in a papermaking machine. The cutter includes an elongated hollow casing extending across and adjacent the face of the paper web under preparation, and an elongated cylinder disposed within and extending along the casing. A plunger movable within the cylinder under the action of fluid under pressure introduced selectively to opposite ends of the cylinder is connected by a flexible line to a nozzle-type cutter movable along a path defined along the casing. A flexible hose extending from a hose collector disposed adjacent one end of the casing extends into the casing to a connection with

the nozzle. The casing may be hingedly mounted on a support adjacent the collector, to permit it to be swung out of the way.

3,625,814
MULTILAYER PAPERMAKING MACHINE WITH IMPERVIOUS ROLL WEB FORMER

Donald B. De Noyer, Beloit, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed June 13, 1969, Ser. No. 832,911
Int. Cl. D21h 1/06
U.S. Cl. 162—299 **6 Claims**

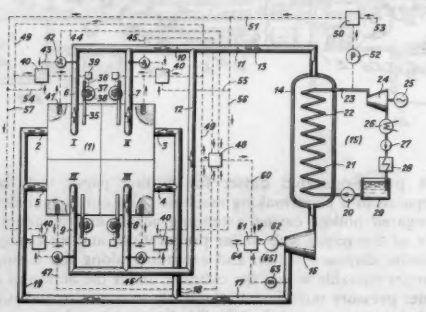


A portion of a papermaking machine is disclosed having several web-forming units in series for making heavy or multilayer paper. Each forming unit includes a headbox mounted above an impervious forming roll for discharging pulp into a nip between a pair of belts coming together and lapping a down turning side of the forming roll. Both belts may be wire fabrics or, preferably, one belt is a felt fabric making contact with the forming roll and the other belt is a wire and arranged radially outward of the felt. The pulp is formed into a web sandwiched between the radially inner felt and radially outer wire and water is squeezed from the pulp web outwardly through the wire. At the bottom of the forming roll the felt is located over the web and wire, and the felt-web-wire is removed from the forming roll and turned downwardly away from the forming roll and inverted to place the wire and web on top of the felt. The wire is lifted from the web and looped back to the forming roll while the web remains on top of the felt and is carried thereby through successive similar forming units for applying additional layers of pulp to the web.

3,625,815
CONTROL SYSTEM FOR CONTROLLING A NUCLEAR REACTOR PLANT

Ygal Fishman, Lausanne-Prilly, Switzerland, assignor to Sulzer Brothers, Ltd., Winterthur, Switzerland

Filed Apr. 30, 1968, Ser. No. 725,281
Int. Cl. G21c 7/06
U.S. Cl. 176—22 **9 Claims**

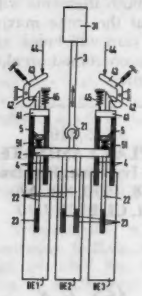


The control rods of the different zones of the plant are moved simultaneously with or independently of the control rods of the other zones. Control of the rod movements is made dependent on the pressure of the working medium of the plant as well as the outlet temperature of the reactor coolant. Additionally, a control of the live steam mass flow of the plant is achieved by comparison between the live steam mass flow and the overall neutron flux of the nuclear reactor.

3,625,816
NUCLEAR REACTOR CONTROL ROD ASSEMBLY

Werner Aleite, Erlangen, and Kurt Bortolazzi, Erlangen-Bruck, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed June 26, 1969, Ser. No. 836,842
Claims priority, application Germany, June 28, 1968, P 17 64 577.1
Int. Cl. G21c 7/08
U.S. Cl. 176—35 **6 Claims**

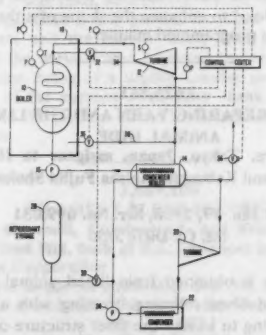


Control rod assembly for nuclear reactors includes a plurality of finger control rods carried in common by a spider-like holder, mechanical drive mechanism for displacing the holder vertically to insert the finger control rods into a plurality of fuel elements, the finger control rods containing neutron-absorbing substance along at least part of the length thereof, means for mounting a plurality of neutron-absorbing shutoff rods outside the reactor core, the mounting means being releasable during abnormal operation of the reactor for inserting the shutoff rods into the fuel elements and entrainment means operatively connected to and displaceable with the finger control rod holder and entrainable by the entrainment means in released condition of the mounting means.

3,625,817
BINARY POWER CYCLE FOR NUCLEAR POWER PLANTS

James H. Anderson, 1615 Hillock Lane, York, Pa.

Filed May 29, 1968, Ser. No. 733,160
Int. Cl. G21c 9/00
U.S. Cl. 176—38 **6 Claims**



An emergency heat sink for a nuclear-powered, steam-generating plant is disclosed which comprises a closed

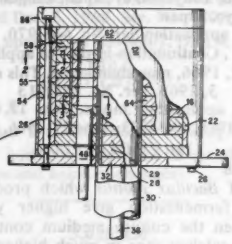
refrigerant circuit including a boiler, a turbine, a condenser and a return pump, the boiler using as a source of heat the condenser in the steam-generating plant. When an abnormal condition occurs such as a runaway reactor, the high-pressure side of the refrigerant circuit is vented to atmosphere and additional liquid refrigerant is bled into the low-pressure side in order to absorb the excess heat and dump it to the atmosphere until reactor control is regained.

3,625,818

FLEXIBLE CORE REACTOR

Gerard Breidenbach, New York, and Richard C. Ross, Armonk, both of N.Y., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed May 17, 1968, Ser. No. 730,202
Int. Cl. G21c *1/00*
U.S. Cl. 176—40 **3 Claims**



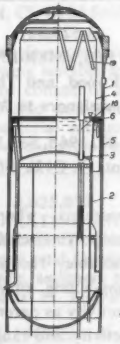
An experimental flexible core reactor with segmented fuel and reflector regions for varying height and width of the core. The segments are layered with materials comprising the fuel, cladding, coolant, and structure to simulate during operation the effect on an operating reactor utilizing such materials.

3,625,819

ATTACHMENT MEANS FOR THE SUPERSTRUCTURE ABOVE THE CORE IN A LIGHT WATER BOILING REACTOR

Bengt Martin Sodergard, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Vasteras, Sweden

Filed Feb. 12, 1968, Ser. No. 704,938
Claims priority, application Sweden, Feb. 14, 1967, 2015/67
Int. Cl. G21c *15/16*
U.S. Cl. 176—54 **6 Claims**



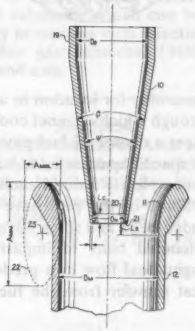
In a light water boiling reactor, a superstructure comprising a steam treating unit and a lid for the moderator tank is arranged above the moderator tank and is detachable for the purpose of interchange of fuel. A shield substantially concentric with the moderator tank and having a greater diameter is attached to the tank in such a position that the upper end of the shield is at a level above the lid of the tank. The superstructure is fixed to the upper part of the shield by a detachable hook joint which transmits compressive force against the lid to force it against the top of the tank through rodlike supporting members.

3,625,820

JET PUMP IN A BOILING WATER-TYPE NUCLEAR REACTOR

Douglas M. Gluntz, Campbell, and Robert H. Moen, San Jose, both of Calif., assignors to General Electric Company

Filed June 14, 1968, Ser. No. 737,090
Int. Cl. G21c *15/24*
U.S. Cl. 176—54 **3 Claims**



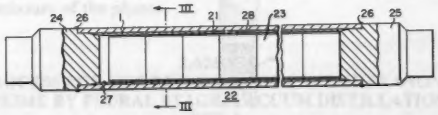
An improved jet pump for a nuclear reactor is disclosed. A combination of novel nozzle, mixer and diffuser configurations give a jet pump of uniquely high efficiency. This jet pump is especially useful in circulating cooling water through a boiling water-type nuclear reactor.

3,625,821

FUEL-ELEMENT COATING CONTAINING BURNABLE POISON

Herbert E. Ricks, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 499,407, Oct. 21, 1965, now abandoned. This application June 26, 1968, Ser. No. 740,218
Int. Cl. G21c *3/06*
U.S. Cl. 176—68 **4 Claims**



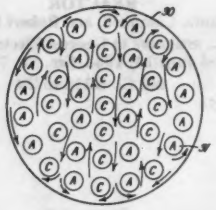
A fuel element for a nuclear reactor having a fuel cladding tube with the inner surface of tube being coated with a retaining metal of low neutron capture cross section and having finely dispersed particles of a burnable poison disposed therein.

3,625,822

NUCLEAR REACTORS AND TO FUEL ELEMENT ASSEMBLIES FOR USE THEREIN

Paul Langford Mantle, Gloucester, England, assignor to Central Electricity Generating Board, London, England

Filed May 16, 1968, Ser. No. 729,751
Claims priority, application Great Britain, May 17, 1967, 22,885/67
Int. Cl. G21c *3/32*
U.S. Cl. 176—78 13 Claims



A fuel element assembly for location in a fuel channel of a nuclear reactor, through which channel coolant is passed longitudinally, comprises a cluster of fuel pins arranged parallel to one another but spaced apart so as to leave a free coolant passage extending completely around each pin for generally longitudinal flow. Some of the pins have multistart helical ribs with a left-handed helix and some have multistart helical ribs with a right-handed helix to impart transverse components to the longitudinal flow in a predetermined pattern to improve the heat transfer from the fuel elements to the coolant.

3,625,823

NUCLEAR FUEL ROD

John M. Kerr, and Gordon C. Larson, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed July 9, 1968, Ser. No. 743,504
Int. Cl. G21c *3/10*
U.S. Cl. 176—79 7 Claims

A sheathed nuclear fuel rod sealed by end caps and having foamed zirconia plugs which separate and thermally insulate the end caps from the fuel material, and also provide internal support for the sheathing and for the fuel.

3,625,824

MICROBIOLOGICAL PROCESS FOR PRODUCTION OF ALKANONES

Lester E. Casida, State College, Pa., and Donald A. Klein, Corvallis, Oreg., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of application Ser. No. 738,117, June 19, 1968, now abandoned. This application Aug. 24, 1970, Ser. No. 66,658
Int. Cl. C12b *1/00*
U.S. Cl. 195—28 9 Claims

Alkanones are produced by growing a species of *Athrobacter*, (ATCC 21237), aerobically in an alkane-salt aqueous medium mixture containing a nonhydrocarbon carbon source. A mixture of monoalkanones are produced from a C_{10}–C_{16} alkane.

3,625,825

METHOD OF PRODUCING NUCLEOSIDES BY FERMENTATION

Hiroshi Shibai; Akira Hama, both of Kanagawa-ken; Akio Yamanoi, Tokyo; Teruo Shiro, Kanagawa-ken, and Kazumoto Kinoshita, Tokyo, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Continuation of application Ser. No. 648,970, June 26, 1967, now abandoned , Continuation-in-part of application Ser. No. 554,322, June 1, 1966, now abandoned. This application Jan. 3, 1969, Ser. No. 788,913
Claims priority, application Japan, June 11, 1965, 40/34332; June 11, 1965, 40/34333; June 27, 1966, 41/41685
Int. Cl. C12d *13/06*
U.S. Cl. 195—28 7 Claims

All strains of *Bacillus subtilis* which produce inosine or guanosine by fermentation give higher yields of these nucleosides when the culture medium contains potassium, magnesium, or calcium ions in much higher concentrations than were commonly employed heretofore.

3,625,826

PROCESS FOR PRODUCING SPICULISPORIC ACID AND RELATED SUBSTANCES THEREOF

Tatsuyoshi Kobayashi, RA24, No. 537, Ikejiri-machi, Setagaya-ku, Tokyo, and Takeshi Tabuchi, No. 667, Iwato, Komae-machi, Kitatamagun, Tokyo, both of Japan

Filed July 22, 1968, Ser. No. 746,343
Int. Cl. C12d *1/00*
U.S. Cl. 195—36 R 12 Claims

A process for producing spiculisporic acid and hydroxy-acid form thereof by fermentation which comprises the steps of: cultivating fungi belonging to *Penicillium spiculisporum* ATCC 16071 in a nutrient culture medium containing carbohydrate materials, nitrogen sources and inorganic salts; cultivating the said culture medium aerobically; controlling the pH value of the culture medium during fermentation at 1.2 to 2.5, and recovering from the cultured broth spiculisporic acid and hydroxy acid.

3,625,827

WATER-SOLUBLE POLYMER-ENZYME PRODUCTS

Bernard S. Wildi, Kirkwood, and Thomas L. Westman, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Sept. 27, 1968, Ser. No. 763,343
Int. Cl. C12k *1/00*
U.S. Cl. 195—63 19 Claims

Polymer-enzyme products wherein the enzyme is covalently bound to the polymer chain, the polymer-enzyme product being water soluble. The products have wide applicability as stable, long-acting, enzymatic materials, having same general type of activity as parent enzyme, but with different pH optimum activity and range of applicability, and are stable, substantially colorless and odorless, long acting, and remarkably less subject to autogenous deterioration or destruction by other enzymes.

3,625,828

PROCESS FOR PRODUCTION OF GLUCOSE ISOMERASE

Charles Edward Brownewell, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Apr. 16, 1969, Ser. No. 816,813
Int. Cl. C12d *13/10*
U.S. Cl. 195—66 R 1 Claim

A novel glucose isomerase enzyme useful for the conversion of glucose to fructose can be prepared by growing under aerobic conditions a culture of *Streptomyces olivaceus* NRRL 3583 or mutants thereof in a medium containing appropriate nutrients and then recovering the enzyme therefrom.

3,625,829

PURIFICATION OF CARBOXYPEPTIDASE B

Gunther Schmidt-Kastner, and Johann Putter, both of Wuppertal-Elberfeld, Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1968, Ser. No. 780,903
Claims priority, application Germany, Dec. 4, 1967, P 16 42 614.5
Int. Cl. C07g *7/02*
U.S. Cl. 195—66 R 7 Claims

Carboxpeptidase B is purified by treating aqueous crude solutions of the carboxypepeptidase B simultaneously with cation exchangers and anion exchangers.

3,625,830

CULTIVATING STREPTOMYCES DESDANUS VAR. DESDANUS TO PRODUCE DESDANINE

Malcolm E. Bergy, Kalamazoo, and Fritz Reusser, Portage, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Apr. 20, 1970, Ser. No. 30,255
Int. Cl. C12d *9/00*
U.S. Cl. 195—80 3 Claims

Microbiological process for preparing the antibiotic desdanine which does not require the addition of an ω-alkylthio-α-amino acid to the fermentation medium. Desdanine can be used for preventing rot and spoilage of shell eggs caused by *Proteus vulgaris*.

3,625,831

PRODUCTION OF (-) (CIS 1,2 EPOXYPROPYL) PHOSPHONIC ACID

Arnold L. Demain, Westfield; Raymond F. White, Englishtown, and Lubove D. Schnable, Fanwood, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Jan. 23, 1969, Ser. No. 793,591
Int. Cl. C12d *9/00*
U.S. Cl. 195—80 10 Claims

(−) (Cis-1,2-epoxypropyl) phosphonic acid is produced in enhanced yields by growing suitable species of *Streptomyces* in fermentation mediums containing a mercapto-containing compound. The phosphonic acid and derivatives thereof, such as salts, are antibacterial substances which are active against both gram-positive and gram-negative bacteria.

3,625,832

PROCESS FOR SEPARATING MICROORGANISMS FROM A FERMENTATION WORT

Claude Gatellier, Boulogne, and Georges Glikmans, Meudon la Foret, both of France, assignors to Institut Francais du Petrole, des Carburants Et Lubrifiant, (Hts de Seine), France

Filed May 5, 1969, Ser. No. 821,985
Claims priority, application France, May 10, 1968, 151500
Int. Cl. C12b *1/26*
U.S. Cl. 195—82 10 Claims

Yeast fermentation worts containing hydrocarbon, water, and inorganic salts, are resolved by contacting the worts with a mixed solvent system containing a dialkyl-ketone having at least four carbon atoms, e.g., methyl-ethyl-ketone, and another solvent selected from acetone, ethanol, n-propanol, iso-propanol and tert-butanol. As a result, three phases are formed, one of which is a heavy aqueous phase containing purified yeast which is then separated from the two other phases.

3,625,833

PROCESS FOR PRODUCING ANTIVIRAL SUBSTANCE FROM STAPHYLOCOCCUS ORGANISMS

James J. Schaffer, 717 West First St., P.O. Box 1015, Bloomington, Ind.

Filed Jan. 23, 1970, Ser. No. 5,366
Int. Cl. C12d *9/20*
U.S. Cl. 195—96 7 Claims

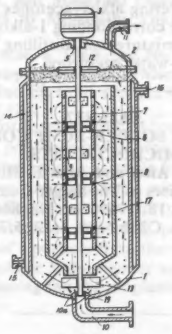
Staphylococcus bacteria are cultured to produce an antiviral substance having inhibitory activity against Coxsacki B virus, Semliki-Forest virus, and the like. For use in the process, a nonpathogenic strain of staphylococcus bacteria is selected, the strain being classifiable as *Staphylococcus albus* or *Staphylococcus aureus* (albus variant). The strain is propagated in a culture medium containing a growth-promoting concentration of aspartic acid, preferably DL aspartic acid. The antiviral substance which can be recovered from the broth has utility in treating viral infections of animals, including transmissible gastroenteritis (TGE) in swine and distemper in dogs and cats.

3,625,834

METHOD OF MIXING GASEOUS AND LIQUID PHASES

Hans Muller, Allmendli l, Erlenbach/Zuerich, Switzerland

Original application July 3, 1967, Ser. No. 651,054, now Patent No. 3,460,810. Divided and this application Apr. 16, 1969, Ser. No. 816,747
Int. Cl. C12b *1/14*; B01f *3/04*
U.S. Cl. 195—109 5 Claims



A mixing method. A crude mixture of a gaseous and a liquid phase is contained in an elongated tubular inner space and in an annular outer space surrounding and communicating with the inner space. Jets of the mixture are forced from the inner into the outer space at longitudinally spaced locations of the inner space, and their intrusion into and dispersion in the mixture in the outer space effects more intimate admixture of the phases.

3,625,835

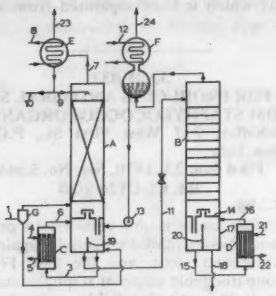
PROCESS FOR THE RECOVERY OF CYCLOHEXANONE OXIME BY PLURAL STAGE, VACUUM DISTILLATION PER A

Adrianus Tervoort, Sittard, and Theodorus Balg, Brunssum, both of Netherlands, assignors to Stamicarbon N.V., Heerlen, Netherlands

Filed June 15, 1970, Ser. No. 046,372
Int. Cl. B01d *3/10*
U.S. Cl. 203—78 3 Claims

There is disclosed a continuous process for preparing cyclohexanone oxime by reacting cyclohexanone with a solu-

tion of a hydroxylammonium salt derived from a weak acid, e.g. phosphoric acid. The reaction takes place in counterflow contact, and in the presence of a water-immiscible or poorly



water-miscible organic solvent for the oxime formed. An improved process for accomplishing separation of the resulting oxime from the solvent by rectification and apparatus suited for realizing this process.

3,625,836

PURIFICATION OF ALKOXYACETONE FROM 1-ALKOXY-2-PROPANOL BY AZEOTROPIC DISTILLATION WITH WATER

Harry A. Stansbury, Jr., South Charleston, and Harry J. Decker, Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed July 22, 1969, Ser. No. 843,790
Int. Cl. B01d *3/36, 3/38*
U.S. Cl. 203—83 **6 Claims**

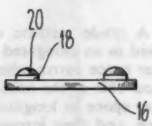
A method for recovering alkoxyacetones from mixtures of alkoxyacetone and the corresponding 1-alkoxy-2-propanol by adding water to the mixture and distilling to form a lower boiling alkoxyacetone-water azeotrope.

3,625,837

ELECTROPLATING SOLDER-BUMP CONNECTORS ON MICROCIRCUITS

Carl W. Nelson, Palo Alto, and John F. Hinchey, Los Altos, both of Calif., assignors to The Singer Company

Filed Sept. 18, 1969, Ser. No. 860,848
Int. Cl. C23b *5/48, 5/32, 5/70*
U.S. Cl. 204—15 **6 Claims**



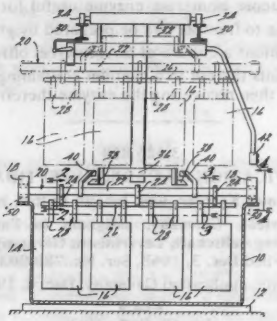
A silicon wafer containing 100 to 300 microcircuits is coated with a patterned layer of glass and then a conducting layer of chromium and copper which connects, through openings in the glass, to circuit terminals and also to the silicon substrate at the scribe positions. A patterned photoresist then exposes only the terminal areas. An electroplating connection to the silicon substrate provides uniform, low-resistance current paths through the metallization at the scribe positions to the plating sites over the terminal positions for the electrodeposition of soldier.

3,625,838

WORK-SUPPORTING DEVICE

Richard J. Jessup, Bloomfield Hills, and Richard T. Wigginton, Jr., Detroit, both of Mich., assignors to The Udylite Corporation

Filed Aug. 8, 1968, Ser. No. 751,226
Int. Cl. C23b *5/70;* **B01k** *3/04*
U.S. Cl. 204—297 **9 Claims**



A lightweight, high-strength work rack for supporting one or a plurality of workpieces for transfer through an electrochemical treatment having a frame including a composite electrically conductive bar consisting of an aluminum core enclosed within and disposed in electrical contact with an exterior copper sleeve.

3,625,839

PROCESS FOR APPLYING DEPOSITS HAVING LUBRICANT PROPERTIES TO WORKPIECES

Jean-Leon Spehner; Roger Haug, and Hans Hoffman, all of c/o Dow Corning GmbH, Munich, Germany

Filed May 11, 1970, Ser. No. 36,501
Claims priority, application Germany, May 12, 1969, P 19 24 263.8
Int. Cl. C23b *5/52*
U.S. Cl. 204—37 R **5 Claims**

An improved process for applying dry-lubricants to solid surfaces with control over the lubricant thickness. The process depends on an initial electrolytic degreasing step followed by electrodeposition of known molybdenum compounds under definite selected conditions. The compounds are then treated with H_2S in an autoclave, at 300 p.s.i. and less than 140° C.

3,625,840

ELECTRODEPOSITION OF RUTHENIUM

David Roy Mason, Ross-on-Wye, and Brian R. Lerwill, Tuffley, both of England, assignors to Engelhard Industries Limited, Sutton, Surrey, England

Filed Jan. 19, 1970, Ser. No. 4,071
Int. Cl. C23b *5/24*
U.S. Cl. 204—47 **20 Claims**

A stable, aqueous electrolyte solution, suitable for use in the electrodeposition of ruthenium, characterized in that it comprises an aqueous solution having a pH in the range 1.2 to 3.0 and contains (a) ruthenium ions complexed by an organic acid, (b) sulfamate ions, and (c) ammonium ions.

3,625,841

COLOR ANODIZING IN AN INORGANIC ELECTROLYTE

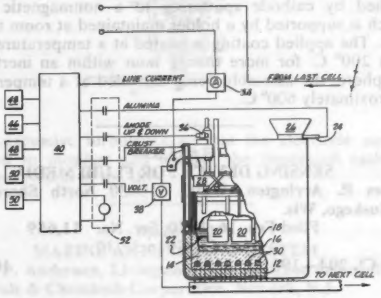
Bernard Ray Baker, Spokane, Wash., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 10, 1969, Ser. No. 805,825
Int. Cl. C23b *9/02*
U.S. Cl. 204—58 **16 Claims**

A process for the color anodizing of aluminum comprising subjecting the aluminum, as an anode to electrolysis in an

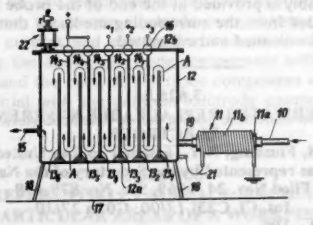
aqueous electrolyte containing sulfuric acid and dichromate ions.

3,625,842
ALUMINA FEED CONTROL
Donald R. Bristol, Orinda, Calif., and Joseph G. C. Simard, also known as J. G. Clement Simard, Ravenswood, W. Va., assignors to Kaiser Aluminum and Chemical Corporation, Oakland, Calif.
Filed May 24, 1968, Ser. No. 731,901
Int. Cl. C22d 3/12
U.S. Cl. 204—67 3 Claims



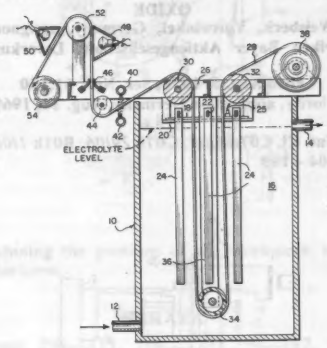
A method of controlling the feeding of alumina to a reduction cell for the production of aluminum. The method comprises obtaining several measurements of the voltage across the cell and current to the cell and deriving from the measurements an average resistance level for the cell which will be referred to as a base level. A smoothed resistance is derived from several sequential measurements of the voltage and current. When the smoothed resistance exceeds the base resistance level by more than an assigned limit, a controlled amount of alumina is added to the cell.

3,625,843
METHOD FOR TREATING BEER
Heinz Doevenspeck, Minden, Germany, assignor to Dr. Richart Eifer Wirtschaftsprufungsgesellschaft und Steuerberatungsgesellschaft mit beschrankter Haftung, Luisenstrasse, Dortmund, Germany
Filed Sept. 25, 1968, Ser. No. 762,492
Claims priority, application Germany, Sept. 26, 1967, P 16 67 029.4
Int. Cl. C12h 1/02; B01k 1/06
U.S. Cl. 204—139 4 Claims



The invention provides a method of and a device for treating disperse systems, preferably liquids, particularly beer, which device comprises at least one cascade container having an inlet and an outlet for the systems to be treated, a plurality of cascade barriers in the form of positive and negative carbon electrodes, and an induction coil connected to said cascade container on the upstream side of said inlet, said induction coil and said negative carbon electrodes being grounded in series.

3,625,844
STAINPROOFING PROCESS AND PRODUCTS RESULTING THEREFROM
Walter A. McKean, Colonia, N.J., assignor to Circuit Foil Corporation, Bordentown, N.J.
Filed June 5, 1969, Ser. No. 830,789
Int. Cl. C23b 1/00, 5/58, 9/00
U.S. Cl. 204—140 6 Claims

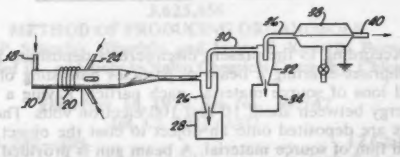


An electrolytic process for imparting stain resistance to sheet copper comprising rendering the copper sheet cathodic in an electrolytic cell containing an aqueous electrolyte containing about 0.4–0.8 grams/liter of hexavalent chromium ions and subjecting said foil to a current density of about 2–4 amps/ft.^{2} for about 6–8 seconds. Products resulting therefrom.

3,625,845
PARTICULATE GRAFTED CELLULOSE-POLYOLEFIN COMPOSITIONS
Yujiro Nakayama, and Masayuki Ogawa, both of Mie-ken, Japan, assignors to Mitsubishi Yuka Kabushiki Kaisha, Tokyo-to, Japan
Filed Mar. 6, 1969, Ser. No. 805,005
Claims priority, application Japan, Mar. 8, 1968, 43/14640
Int. Cl. C08f 33/08, 29/50
U.S. Cl. 204—159.12 6 Claims

A composition for forming articles composed essentially of two thermoplastic polymers one of which is at least partially grafted on the other and a particle-form, cellulosic high-polymer substance impregnated with a thermoplastic polymer, and an effective method for producing such compositions which comprises imparting polymerization conditions to a mixture of a particle-form thermoplastic polymer, a particle-form, cellulosic high-polymer substance, and a vinyl monomer for producing the thermoplastic polymer.

3,625,846
CHEMICAL PROCESS AND APPARATUS UTILIZING A PLASMA
Henry Drummond Murdoch, and Stephen Mark Lesley Hamblyn, both of Surry, England, assignors to United States Borax & Chemical Corporation, Los Angeles, Calif.
Filed June 17, 1968, Ser. No. 737,464
Claims priority, application Great Britain, July 3, 1967, 30,545/67
Int. Cl. C01b 35/00; B01k 1/00
U.S. Cl. 204—164 14 Claims



Process and apparatus for effecting chemical reaction in a plasma in which a plasma is formed by radio frequency

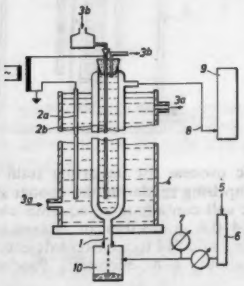
coupling, one reactant is fed into the plasma downstream from the center of the plasma and another reactant is fed into the plasma-forming stream or into the formed plasma. For example, very fine elemental boron can be produced by reduction of a boron halide with hydrogen.

3,625,847

DIRECT OXIDATION OF PROPYLENE TO PROPYLENE OXIDE

Roland Weisbeck, Volswinkel, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 5, 1970, Ser. No. 61,130
Claims priority, application Germany, Aug. 14, 1969, P 19 41 378.6
Int. Cl. C07d *1/08;* **C07b** *29/06;* **B01k** *1/00*
U.S. Cl. 204—169 **14 Claims**



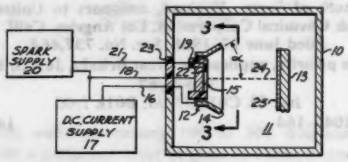
Process for the direct oxidation of propylene to propylene oxide, comprising establishing an alternating electric current gas discharge in a circuit including a gap bounded on at least one side with a material of high-dielectric constant, the voltage being of such magnitude that a gas discharge plasma is established across said zone, continuously supplying to said gap a gaseous mixture of propylene and an oxygen-containing gas, and continuously withdrawing from said gap a gaseous mixture containing propylene oxide. The gap may be defined by two coaxial glass tubes. By use of particular frequencies and voltages and by inclusion of resistances and inductances in the circuit high yields and conversions can be achieved.

3,625,848

ARC DEPOSITION PROCESS AND APPARATUS

Alvin A. Snaper, 2800 Cameo Cir., Las Vegas, Nev.

Filed Dec. 26, 1968, Ser. No. 787,029
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **18 Claims**



According to the present disclosure, a deposition process comprises emitting a beam of particles consisting of atoms and ions of source material, each particle having a kinetic energy between about 10 and 100 electron volts. The particles are deposited onto an object to coat the object with a thin film of source material. A beam gun is provided having an anode and a cathode and is supplied with current of such magnitude as to cause an arc discharge to occur between the anode and cathode to emit the beam.

3,625,849

MANUFACTURE OF MAGNETIC MEDIUM

Dietrich R. Rogalla, Boblingen, Germany, assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 24, 1969, Ser. No. 860,525
Claims priority, application Germany, Oct. 2, 1968, P 18 00 523.7
Int. Cl. C23c *15/00*
U.S. Cl. 204—192 **5 Claims**

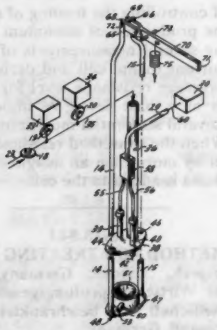
To make a magnetic record medium having high coercivity and low magnetostriction, an alloy consisting of a magnetic component and nonmagnetic component in a solid solution is applied by cathode sputtering to a nonmagnetic carrier, which is supported by a holder maintained at room temperature. The applied coating is heated at a temperature greater than 200° C. for more than 1 hour within an inert gas atmosphere, the assembly being annealed at a temperature of approximately 600° C.

3,625,850

SENSING DEVICE FOR FLUID MEDIA

James R. Arrington, W203 S10630 North Shore Drive, Muskego, Wis.

Filed Feb. 16, 1970, Ser. No. 11,659
Int. Cl. G01n *37/30*
U.S. Cl. 204—195 **10 Claims**



A device for sensing electrochemical conditions in a fluid media which permits the sensing electrodes to be selectively exposed to or protected from the fluid media. The device is equipped with means to deliver accessory agents such as cleaning solutions, buffering solutions and cleaning water and a cup assembly is provided at the end of the probe to seal off the electrodes from the surrounding media so that the electrodes can be cleaned and calibrated.

3,625,851

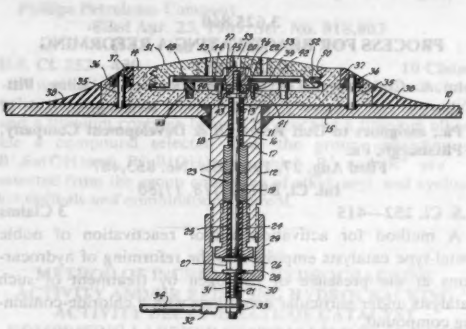
UNDERWATER REPLACEABLE REFERENCE ELECTRODE

Isidore Geld, Flushing, N.Y., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 24, 1969, Ser. No. 879,478
Int. Cl. C23f *13/00;* **G01n** *27/30*
U.S. Cl. 204—196 **6 Claims**

A series of layers of silver gauze are welded to a central silver nut to form a reference electrode. The electrode is threaded onto the end of a silver-plated phosphor bronze connecting rod which extends through a ship's hull by way of a waterproof stuffing tube. Interposed between the hull and the electrode is an insulating layer with the electrode spaced therefrom while the rod is provided with an electrically insulating outer layer to minimize the development of undesirable potentials between the rod and the stuffing tube. A

holder cover is situated over the reference electrode, permitting free flooding of the area proximate the electrode



without excessive turbulence so that the electrode can be employed to monitor and control the impressed cathodic protection system of the ship.

3,625,852

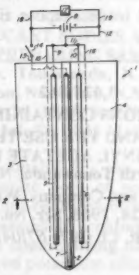
MARINE ANTIFOULING SYSTEM

Edward P. Anderson, Livingston, N.J., assignor to Engelhard Minerals & Chemicals Corporation, Newark, N.J.

Filed June 27, 1969, Ser. No. 837,223

Int. Cl. C23f *13/00*

U.S. Cl. 204—196 **3 Claims**



A marine antifouling system for boat or ship hulls having a keel and sides diverging upwardly therefrom, the antifouling system comprising a pair of laterally spaced elongated anode electrode components each mounted externally on one side of the hull substantially adjacent the keel and lengthwise thereof, an elongated cathode electrode component mounted externally on and lengthwise of the keel in spaced relationship between the anode electrode components, a source of electrical current and electrical circuit means therefor for energizing the anode electrode components with a positive potential and the cathode electrode component with a negative potential with the cathode electrode component being electrolytically common to the anode electrode components.

3,625,853

PREFERENTIALLY SURFACE MACHINING PARTICULAR AREAS OF A WORKPIECE

John Gowen Melvin, Deep River, Ontario, Canada; Alec Duncan McEachern, Harwell, Didcot, England, and John Gerald McManus, Ottawa, Ontario, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Province of Ontario, Canada

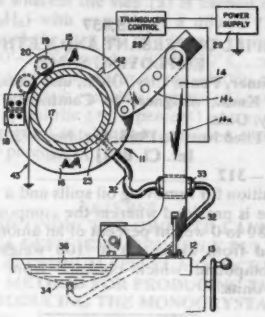
Filed Oct. 25, 1968, Ser. No. 770,633

Claims priority, application Canada, Nov. 29, 1967, 6,191

Int. Cl. B23p *1/02;* **C23b** *5/76*

U.S. Cl. 204—224 **4 Claims**

The uniform thickness of a workpiece is achieved by measuring the workpiece thickness, for example, by ultrasonic waves, and in response thereto preferentially, electrochemically machining the portions of the workpiece having increased thickness.



ERRATA

For Classes 208—111, 208—179, 208—187, 210—10, 210—19, 210—23, 210—32, 252—1, 252—8, 252—32, 252—33, 252—49, 252—62, 252—75, 252—87, 252—89, 252—99, 252—107, 252—109, 252—121, 252—138, 252—142, 252—153 and 252—161 see: Patent Nos. 3,625,878 thru 3,625,910

3,625,854

OVEN-CLEANING COMPOSITION

Bob G. Gower, Park Forest, and Hector J. Gonzalez, Hazel Crest, both of Ill., assignors to Sinclair Research, Inc., New York, N.Y.

Filed May 10, 1968, Ser. No. 728,323

Int. Cl. C09d *9/04;* **C11d** *7/50;* **C23g** *5/02*

U.S. Cl. 252—171 **6 Claims**

An oven-cleaning composition comprising about 2 to 30 weight percent of an alkali metal or ammonium salt of a copolymer of styrene and maleic anyhdride, the copolymer of styrene and maleic anhydride having a molecular weight of about 500 to 50,000 and a molar ratio of styrene to maleic anhydride of about 1:1 to 4:1; about 1 to 10 weight percent of a caustic material which can be an alkali metal oxide or hydroxide, an alkali metal silicate, or an alkanol amine; and about 60 to 97 weight percent water.

3,625,855

WHITE SMOKE COMPOSITION

Bernard E. Douda, Bloomfield, Ind., assignor to The United States of America as represented by the Secretary of the Navy

Filed Nov. 3, 1969, Ser. No. 873,687

Int. Cl. C06d *3/00;* **C09k** *3/30*

U.S. Cl. 252—305 **2 Claims**

A composition having long burning time and producing high volume white smoke and being comprised of between 11 and 13 percent of magnesium, between 44 and 49 percent of zinc oxide, between 25 and 26 percent of a chlorinated organic compound, and between 14 and 22 percent of a nonacid-type binder.

3,625,856

METHOD OF PRODUCING ORGANOSOLS

David P. Schaefer, Hinsdale, and James F. Kovarik, Berwyn, both of Ill., assignors to Nalco Chemical Company, Chicago, Ill.

Filed Nov. 16, 1970, Ser. No. 90,147

Int. Cl. B01j *13/00*

U.S. Cl. 252—309 **12 Claims**

A method of producing stable organosols, including pure metal oxide sols and coated silica sols, is accomplished by the

means of an extraction reagent and an organic, water-immiscible solvent.

3,625,857

OIL SPILL DISPERSANT AND METHOD FOR EMPLOYING SAME

Dean R. Weimer, Ponca City, Okla., and James A. Wingrave, Emporia, Kans., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 4, 1968, Ser. No. 773,337
Int. Cl. B01j *13/00*
U.S. Cl. 252—312 10 Claims

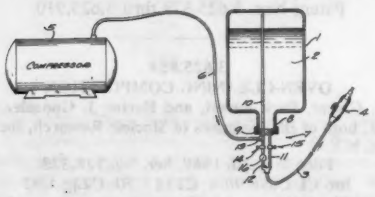
A composition for removing oil spills and a method for employing same is provided wherein the composition comprises from about 80 to 0 weight percent of an anionic surfactant or pine oil and from about 20 to 100 weight percent of a nonionic compound which contains from about 2 to 4 (CH_2CH_2O) units.

3,625,858

LIQUID CONVERTER ASSEMBLY

Phillip John Conn, 2526 West Brown St., Milwaukee, Wis.

Filed Aug. 8, 1969, Ser. No. 848,485
Int. Cl. B01d ; B01f ; B01j *13/00*
U.S. Cl. 252—359 E 12 Claims



The disclosure includes a hair shampoo foam generator having a liquid shampoo within a bottle having an air tube and a liquid tube. An air compressor is connected to the air tube to pressurize the container and force the liquid out through the liquid tube. The compressor is also connected directly to the liquid tube to mix with the liquid forced outwardly through the liquid tube within a mixing length of the liquid tube, thereby generating a foam. The characteristic or wetness of the foam may be controlled by valves in the air and liquid tubes, which control the relative quantities of air and liquid introduced into the mixing tube portion.

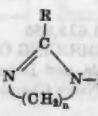
3,625,859

CORROSION INHIBITING COMPOSITION

Sei Hashimoto, and Kunihiko Hirose, both of Kyoto, Japan, assignors to San-Abbott Limited, Kyoto, Japan

Filed July 31, 1969, Ser. No. 846,612
Claims priority, application Japan, Aug. 6, 1968, 43/55740
Int. Cl. C23f *11/10, 11/14*
U.S. Cl. 252—392 8 Claims

Fatty acid addition salts of amines of the formula



wherein R and R′ are inert radicals and together may form a methylene chain and *n* is 2, 3, 4 or 5, and compositions containing such salts and specific extenders have been found to be effective corrosion inhibitors for aqueous and oil systems.

3,625,860

PROCESS FOR REACTIVATING A REFORMING CATALYST

John A. Condrasky, Tokyo, Japan; Robert E. Kline, Pittsburgh, and Stanley J. Kwolek, New Kensington, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Aug. 27, 1969, Ser. No. 853,487
Int. Cl. B01j *11/18, 11/80*
U.S. Cl. 252—415 3 Claims

A method for activation and/or reactivation of noble metal-type catalysts employed in the reforming of hydrocarbons in the presence of hydrogen by treatment of such catalysts under particular conditions with a chloride-containing compound.

3,625,861

REGENERATION OF ZINC HALIDE CATALYST USED IN THE HYDROCRACKING OF POLYNUCLEAR HYDROCARBONS

Everett Gorin, 439 Austin Ave., Pittsburgh, Pa.; Robert T. Struck, 2347 Morton Road, Pittsburgh, Pa., and Clyde W. Zielke, 195 Dell Ave., Pittsburgh, Pa.

Filed Dec. 15, 1969, Ser. No. 884,855
Int. Cl. B01j *11/80, 11/04*
U.S. Cl. 252—416 10 Claims

Spent zinc halide cracking catalyst, prior to oxidation to remove impurities, is heated to carbonize organic residue to drive off volatiles, and to decompose zinc halide-NH_3 complex and drive off NH_3.

3,625,862

LIQUID COMPOSITIONS CONTAINING A PALLADIUM (II) COMPOUND AND THE USE THEREOF IN THE PRODUCTION OF VINYL ACETATE FROM ETHYLENE

Melvin J. Freamo, North Tonawanda, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 24, 1968, Ser. No. 732,000
Int. Cl. C07c *67/04*
U.S. Cl. 252—429 6 Claims

A liquid composition containing acetic acid, up to 20 weight percent water, a palladium (II) compound, and copper and alkali metal salts which provide the following at specified concentrations: copper, lithium, sodium and potassium cations; and, acetate and chloride and/or bromide anions. Also, a method wherein such a composition is reacted with ethylene to produce vinyl acetate.

3,625,863

PROCESS FOR THE PRODUCTION OF FIXED BED OXIDATION CATALYSTS

Karl-Heinz Heller, Moers; Claus Wulff, Krefeld-Bockum, Germany, and Ludwig Muller, New York, N.Y., assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 9, 1969, Ser. No. 856,496
Claims priority, application Germany, Oct. 5, 1968, P 18 01 401.2
Int. Cl. B01j *11/82*
U.S. Cl. 252—437 3 Claims

Producing a precipitate from an aqueous solution of a vanadium compound and a phosphoric acid compound, drying the precipitate, calcining the product, which is not yet finally moulded, at temperatures between about 300° and 650° C. in the presence of air, then grinding and finally moulding it without applying elevated temperatures.

3,625,864

POLYMERIZATION CATALYST SYSTEM ADDITIVES

Bertalan Horvath, Southern London, England, assignor to Phillips Petroleum Company

Filed Apr. 23, 1969, Ser. No. 818,803
Int. Cl. C08d 3/04
U.S. Cl. 252—430 10 Claims

A method of preparing a polymerization catalyst which involves impregnating a catalyst support with chromium oxide and a titanium complex formed by reacting a titanium alkoxide a compound selected from the group consisting of $R'_2Sn(OH)$and $R''_2B(OH)_2$ in which R′ and R″ are selected from the group consisting of alkyl, aryl, and cycloalkyl radicals and combinations thereof.

3,625,865

METHOD OF INCREASING HYDROCRACKING ACTIVITY AND/OR REDUCING HYDROCRACKING ACTIVITY DECLINE RATE OF CATALYST COMPRISING LAYERED CRYSTALLINE CLAY-TYPE ALUMINOSILICATE COMPONENT

James R. Kittrell, El Cerrito; Gordon E. Langlois, Lafayette, and John W. Scott, Jr., Ross, all of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Oct. 21, 1968, Ser. No. 769,376
Int. Cl. B01j 11/40
U.S. Cl. 252—455 R 9 Claims

The method of treating a catalyst comprising a layered crystalline clay-type aluminosilicate component, to restore thereto at least a portion of the hydrocracking activity lost by dehydration, or to prevent dehydration-caused activity decline thereof during hydrocracking process operation, which comprises adding water to said catalyst.

3,625,866

ZEOLITIC DESICCANT BODIES AND PROCESS FOR PREPARING SAME

Robert Mark Conde, Tonawanda, N.Y., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 24, 1969, Ser. No. 844,666
Int. Cl. B01j 11/40
U.S. Cl. 252—455 Z 8 Claims

Adsorbent bodies suitable for use in drying refrigerants comprise an agglomerate core of zeolitic molecular sieve crystals having thereon over substantially its entire outer surface a hardened permeable coating of a diaspore-clay mineral mixture, said coating being hardened by having impregnated therein cured potassium silicate.

3,625,867

PROCESS FOR PRODUCTION OF METAL OXIDE-ANTIMONY OXIDE CATALYSTS

Takachika Yoshino, 80-3 Yamashitacho, NaKa-ku, Yokohama; Shigeru Saito, 28 Harumicho-1-chome, Fuchu-shi; Masukuni Sobukawa, 19, Kametakada-4-chome, Nakano-ku, Tokyo, and Tadao Shizokuishi, 447-26, Nagatacho, Minami-ku, Yokohama, all of Japan

Filed May 28, 1968, Ser. No. 740,849
Claims priority, application Japan, June 2, 1967, 42/34874
Int. Cl. B01j 11/06
U.S. Cl. 252—456 13 Claims

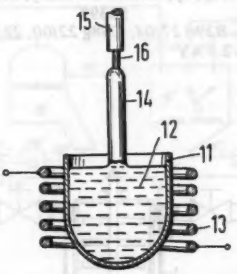
This invention provides an improved process for producing a metal oxide-antimony oxide catalyst, which comprises the steps of (a) heat treating an intimate mixture of the catalyst ingredients at a temperature of 200°–600° C. in the presence of a reducing gas or vapor having an electron donor character, said gas or vapor being present in an amount sufficient to make up a reducing atmosphere, (b) precalcining the resulting product at a temperature of 300°–600° C. in an oxidative atmosphere, and (c) calcining the precalcined product at a temperature of 800°–1,000° C. in an oxidative atmosphere. A precalcination and a final calcination similar to the steps (b) and (c), per se, are known; but the step (a) and the combination of steps (a), (b) and (c) are novel. The catalysts prepared by the present process are useful for oxidation and ammoxidation of olefins, and they exhibit an improved activity and an improved selectivity with respect to the objective product. For example, iron (uranium or tin) oxide-antimony oxide catalyst supported on silica is prepared according to the present process wherein the step (a) is carried out by using NH_3 (H_2 or C_3H_8) with or without a diluent (N_2, etc.) at 350°–400° C., and the step (b) and (c) are carried out in an airstream at 400°–550° C. and at 900°–950° C., respectively. The resulting catalyst is used for ammoxidation of propylene to acrylonitrile, and it exhibits improved conversion of propylene to acrylonitrile (≈71 percent) compared with the corresponding control catalyst not subjected to the step (a) treatment (≈66 percent).

3,625,868

THIN SEMICONDUCTOR GROWTH LAYER ON ALUMINA DEFICIENT, CRUCIBLE-PULLED MAGNESIUM ALUMINUM SPINEL MONOCRYSTAL AS WELL AS THE METHOD FOR PRODUCING THE LAYER AND PRODUCING THE MONOCRYSTALS

Josef Grabmaier, Unterhaching, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany

Filed June 16, 1969, Ser. No. 833,342
Claims priority, application Germany, June 20, 1968, P 17 69 635.4
Int. Cl. H01b 1/06
U.S. Cl. 252—521 11 Claims



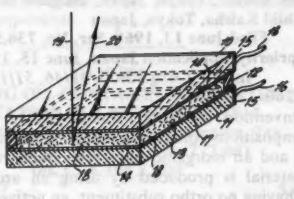
Described are magnesium aluminum spinel monocrystals with a ratio of magnesia to alumina between 1:2.5 and 1:1. The crystals are pulled from a crucible. The surface of the crystals is used as a substrate for growing a semiconductor layer.

3,625,869

METHOD OF INCREASING THE RESISTIVITY OF A DIPOLE SUSPENSION

Alvin M. Marks, 153–16 Tenth Ave., Whitestone, N.Y.

Original application Aug. 28, 1965, Ser. No. 490,943, now Patent No. 3,341,274. Divided and this application July 17, 1967, Ser. No. 653,921
Int. Cl. H01b 1/00
U.S. Cl. 252—500 3 Claims



An electrically responsive light-controlling device in the form of a sealed thin tanklike member having a fluid suspension of light reflective dipoles therein. Electrically conductive layers are disposed on each major side of the tanklike

member to selectively impress an electrical potential across the suspension to align the dipoles. A method of increasing the resistivity of the dipole suspension is also disclosed.

3,625,870

PROCESS FOR THE HALOALKYLATION OF CROSS-LINKED STYRENE COPOLYMERS

Amos Norwood, Philadelphia, Pa., assignor to Sybron Corporation, Rochester, N.Y.

Filed Mar. 4, 1969, Ser. No. 804,288
Int. Cl. C08f *27/02, 27/08, 19/12*
U.S. Cl. 260—2.1 E **5 Claims**

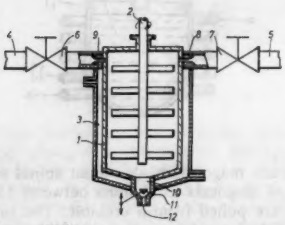
Haloalkylated aromatic compounds including polymers and copolymers having at least one substitutable nuclear hydrogen per aromatic nucleus are produced by reacting said compounds with an excess of a haloalkylating agent in the presence of a haloalkylating catalyst and zirconium tetrachloride.

3,625,871

PROCESS FOR THE PRODUCTION OF MICROPOROUS SHEET STRUCTURES AND MICROPOROUS SHEET

Harro Traubel; Klaus Konig; Wolfgang Heydkamp, all of Leverkusen, and Karl Breer, Cologne, Flittard, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 7, 1968, Ser. No. 727,171
Claims priority, application Germany, May 12, 1967, F 52392
Int. Cl. B29d *27/04;* **C08g** *22/00, 22/36, 22/44*
U.S. Cl. 260—2.5 AY **13 Claims**



Microporous sheet structures are prepared by reacting a polymeric polyamine having a molecular weight of from about 350 to about 6000 with substantially an equivalent amount of an organic polyisocyanate in the presence of a nonsolvent for the product, shaping the reaction mixture into a sheet structure before polyaddition is complete and removing the nonsolvent.

3,625,872

FLAME-RESISTIVE POLYURETHANE FOAM COMPOSITION

Kaneyoshi Ashida, Tokyo, Japan, assignor to Nisshin Boseki Kabushiki Kaisha, Tokyo, Japan

Filed June 13, 1968, Ser. No. 736,571
Claims priority, application Japan, June 15, 1967, 42/37878
Int. Cl. C08g *22/06, 22/46, 51/10*
U.S. Cl. 260—2.5 AK **8 Claims**

This invention relates to flame-resistive, nonflammable foam compositions comprising a flame-resistive organic foam material and an inorganic filler. The flame-resistive organic foam material is produced by using an aromatic polyisocyanate having no ortho substituent, an active hydrogen-containing compound, a foaming agent and a catalyst and the inorganic filler is graphite, talc, or inorganic fiber or the like. The flame-resistive foam compositions are used as insulators for walls, chemical plants and tanks for storing a liquefied natural gas and other apparatus.

3,625,873

POLYIMIDE HOLLOW SPHERES

Glenn R. Wilson, Dayton, Ohio, assignor to Monsanto Research Corporation, St. Louis, Mo.

Filed Nov. 9, 1967, Ser. No. 681,934
Int. Cl. B01j *13/02;* **C08j** *1/14*
U.S. Cl. 260—2.5 B **6 Claims**

A method of making polyimide hollow spheres from a tetracarboxylic acid-ditertiary amine reaction product and an aromatic diamine in an aqueous solution.

3,625,874

PHENOL-CYCLIC POLYOLEFIN REACTION PRODUCTS AS STABILIZERS FOR POLYMERS

Kirkwood S. Cottman, Akron; William S. Hollingshead, Cuyahoga Falls, and Ronald B. Spacht, Hudson, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Feb. 19, 1968, Ser. No. 706,656
Int. Cl. C08g *33/10, 49/04*
U.S. Cl. 260—5 **6 Claims**

Reaction products of monocyclic and bicyclic diolefins with phenols as age resistors for polymers.

3,625,875

ANAEROBIC ADHESIVE AND SEALANT COMPOSITIONS IN NONFLOWABLE FORM

Elliott Frauenglass, Newington, Conn., and William E. Cass, Wayland, Mass., assignors to Loctite Corporation, Newington, Conn.

Filed Feb. 29, 1968, Ser. No. 709,228
Int. Cl. C08f *3/66, 45/30*
U.S. Cl. 260—17 A **10 Claims**

Sheets, such as films and gasket material, and coatings which are adhesive in nature can be made from a thermoplastic polymer by plasticizing the polymer with an anaerobic adhesive, i.e., a mixture of a polymerizable liquid acrylate ester monomer and a peroxy polymerization initiator.

3,625,876

VINYLIDENE CHLORIDE POLYMER COATING COMPOSITION FOR THERMOPLASTIC FILMS

Chester W. Fitko, Chicago, Ill., assignor to Continental Can Company, Inc., New York, N.Y.

Filed July 2, 1968, Ser. No. 742,027
Int. Cl. C08f *29/12*
U.S. Cl. 260—23.7 **6 Claims**

A coating composition which has low gas transmission properties and is strongly adherent to thermoplastic film materials which comprises a solution in a volatile organic solvent of a vinylidene chloride polymer, a butadiene/acrylonitrile copolymer, an epoxidized unsaturated oil, an organic polyisocyanate and a free radical-producing catalyst.

3,625,877

HIGH-MODULUS POLYCARBONATE COMPOSITIONS

Winston J. Jackson, Jr., and John R. Caldwell, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of application Ser. No. 561,370, June 29, 1966, now Patent No. 3,386,935, dated June 4, 1968, which is a continuation-in-part of application Ser. No. 445,686, Apr. 5, 1965, now abandoned , Continuation-in-part of application Ser. No. 372,093, June 2, 1964, now abandoned. This application Jan. 8, 1968, Ser. No. 696,124
Int. Cl. C08q *17/16*
U.S. Cl. 260—24 **13 Claims**

This application discloses improved thermoplastic compositions particularly polycarbonates or polyesters prepared from aromatic dihydroxy compounds, which compositions have been modified with certain stiffening agents, which increase, for example, modulus, tensile strength and hardness, while lowering elongation. The stiffening agents are polar compounds which contain at least one atom selected from the group consisting of halogen, oxygen, nitrogen, and sulfur and wherein said polar compound contains at least two nonbridged rings, each ring containing from four to eight atoms,

and wherein said rings are either carbocyclic rings or heterocyclic rings, and wherein said polar compound has in at least 65 percent of the length of its molecule one dimension less than about 5.5 Angstrom units, and wherein said polar compound has a glass transition temperature greater than −50° C.

3,625,878

OXIDATION-RESISTANT MINERAL OIL

Henri Gourlaouen, Mont-Saint-Aignan; Christian Jahan, Bois-Guillaume; Robert Muths, Mont-Saint-Aignan, and Jean Taillardat, Mont-Saint-Aignan, all of France, assignors to Esso Research and Engineering Company

Filed Dec. 17, 1969, Ser. No. 885,970
Claims priority, application France, Dec. 30, 1968, 181618
Int. Cl. H01b *3/22*
U.S. Cl. 208—14 **19 Claims**

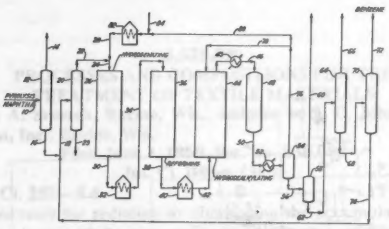
A stable mineral oil composition comprises a base mineral oil to which has been added a synergistically acting mixture of heavy cycle gas oil and coal oil obtained from the distillation of coal tars. Preferably, at least one of the components of the composition has been subjected to mild hydrogenation.

3,625,879

BENZENE FROM PYROLYSIS GASOLINE

William A. Horne, Oakmont, and Ronald V. Luzar, Broomall, both of Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Jan. 7, 1970, Ser. No. 1,099
Int. Cl. C10g *37/10, 39/00*
U.S. Cl. 208—57 **17 Claims**



A process for the production and recovery of benzene from pyrolysis naphtha produced by high-temperature cracking of ethane, propane, naphtha or gas oil to produce ethylene. The process comprises the steps of hydrogenating a selected cut of pyrolysis naphtha to saturate olefins, reforming the hydrocarbon product from the hydrogenation step to convert benzene precursors to aromatic compounds and partially crack the nonaromatic hydrocarbons present and thereafter hydrodealkylating the hydrocarbon product from the reforming step to convert the alkyl aromatics to benzene and further crack nonaromatic compounds including those boiling at about the benzene boiling point, so that benzene may then be separated from the hydrodealkylation effluent by conventional distillation.

3,625,880

CATALYSTS FOR THE SELECTIVE CONVERSION OF STRAIGHT-CHAIN HYDROCARBONS

Glen P. Hamner, Baton Rouge, and Ralph B. Mason, Denham Springs, both of La., assignors to Esso Research and Engineering Company

Continuation-in-part of application Ser. No. 667,660, Sept. 14, 1967, now Patent No. 3,575,846, and a continuation-in-part of 637,911, May 12, 1967, now Patent No. 3,497,448.
This application Oct. 15, 1969, Ser. No. 866,742
Int. Cl. C10g *37/06*; C07c *3/58*; B01j *11/40*
U.S. Cl. 208—111 **16 Claims**

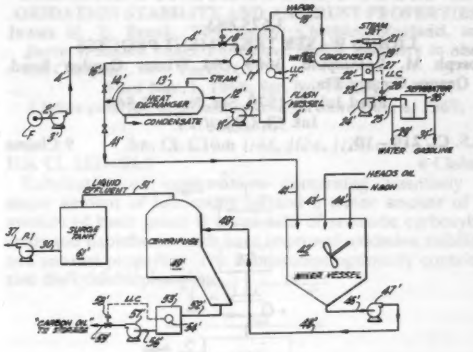
Improved catalysts for the selective conversion of straight-chain hydrocarbons contained in a hydrocarbon feed comprise a synthetic, relatively small pore size crystalline alumino-silicate zeolite. Preferably, the synthetic small pore size zeolite is combined with a metallic hydrogenation component and used in the selective conversion of low octane-producing normal paraffins to upgrade the hydrocarbon feed stock. The process is preferably conducted in the presence of added hydrogen at elevated temperatures and pressures.

3,625,881

CRANK CASE OIL REFINING

John M. Chambers, Westfield, N.J., and Herbert A. Hadley, Birdsboro, Pa., assignors to Berks Associates, Inc., Pottstown, Pa.

Filed Aug. 31, 1970, Ser. No. 68,389
Int. Cl. C10g *27/100*
U.S. Cl. 208—179 **14 Claims**



Lubricating oils are reclaimed from used crankcase oils obtained from gasoline or diesel internal combustion engines, or mixtures thereof, by flash vaporization of substantially all the water content of the used oil at noncoking temperatures; admixing the dried oil with a hydrocarbon oil having an ASTM boiling range of about 150°–250° F. and a 50 percent point of about 200° F., to precipitate carbonaceous solids; said admixing taking place in the presence of a concentrated aqueous alkali metal hydroxide in a minor amount and at a moderately elevated temperature; centrifugally separating the solid precipitate from the treated liquid oil admixture; subjecting the separated treated liquid oil admixture to a first fractional distillation under conditions which will preclude coking or degradation of the lubricating components thereof; removing undesirable water-soluble components from a water-containing overhead fraction; and subjecting the bottoms fraction to a second fractional distillation to obtain lubricating oil cuts and a usable bottoms product. The water from the flash vaporization may be combined with the water-containing overhead fraction for removal of undesirable water-soluble components.

3,625,882

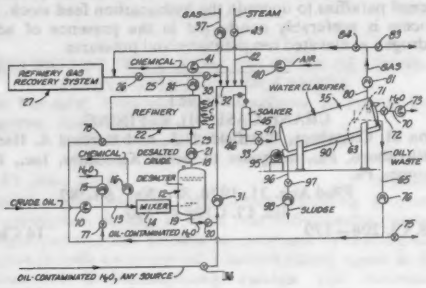
CLARIFYING OIL-CONTAMINATED WATER BY FLOTATION IN A CLOSED SYSTEM

Logan C. Waterman, 3634 Locke Lane, Houston, Tex.

Filed Oct. 31, 1968, Ser. No. 772,081
Int. Cl. C10g *33/00*
U.S. Cl. 208—187 **5 Claims**

A clarifier for oil-contaminated water from a desalter or other source, the water being clarified by gas flotation effected in a closed vessel having an upper inclined wall guiding the oily waste material to a collection zone of the vessel without the use of mechanical surface skimmers. The flota-

tion is usually effected at a pressure other than atmospheric. The oily waste material and the separated gas may be further



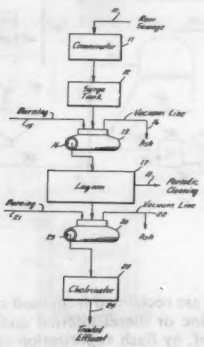
treated for recovery of valuable products, as by being returned to the desalter or to refinery equipment.

3,625,883

LIQUID WASTE TREATMENT PROCESS

Joseph M. Valdespino, 3609 Old Winter Garden Road, Orange County, Fla.

Filed July 6, 1970, Ser. No. 52,569
Int. Cl. C02c *1/24*
U.S. Cl. 210—10 **9 Claims**



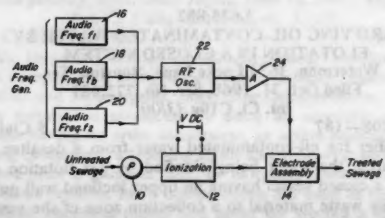
An advanced liquid waste treatment process is provided for treating sewage and other liquid waste and having steps including centrifuging the waste through filter mediums to remove solids from the effluent both before and after lagooning the effluent to remove soluble phosphates, nitrates, and the like. The solids removed during the filtration are burned and the final effluent may be sterilized such as by the addition of chlorine.

3,625,884

SEWAGE TREATMENT PROCESS

Owen R. Waltrip, Roseville, Calif., assignor to Sonetics, Inc.

Continuation-in-part of application Ser. No. 679,484, Oct. 31, 1967, now Patent No. 3,480,529, dated Oct. 31, 1967. This application Sept. 9, 1969, Ser. No. 856,284
Int. Cl. C02c *1/00*
U.S. Cl. 210—19 **22 Claims**



Treatment of a polluted medium such as sewage by dissociation of organic compounds. By injecting audiofrequency energy and ionizing the sewage, the contaminants and pollutants are rendered harmless. The audiofrequencies are selected to deal with the organic matter or compounds and other dissolved or colloidally suspended components constituting the pollutants or contaminants of the sewage.

3,625,885

RECOVERY OF CHROMATES BY REVERSE OSMOSIS

Anthony Geinopolos, West Allis; Mahendra K. Gupta, West Allis, and William J. Katz, Milwaukee, all of Wis., assignors to Rex Chainbelt Inc., Milwaukee, Wis.

Filed May 13, 1971, Ser. No. 143,188
Int. Cl. B01d *13/00*
U.S. Cl. 210—23 **3 Claims**

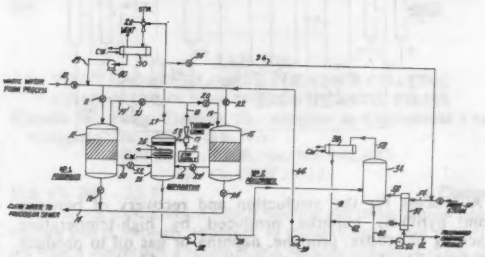
Process water containing hexavalent chromium is pretreated to bring it to a state of dichromate dominance and the water is then subjected to reverse osmosis using a loose membrane. The membrane allows passage of most of the dichromate ions with the product water while concurrently effecting a significant reduction in the hardness and dissolved solids levels. The softened product water containing dichromate ions is recyclable with the recirculated process water and the wasted fraction contains substantially lower amounts of potentially harmful chromium.

3,625,886

PROCESS FOR RECOVERING ORGANIC MATERIAL FROM AQUEOUS STREAMS

Manlio M. Mattia, Ridley Park, Pa., assignor to Day & Zimmermann, Inc., Philadelphia, Pa.

Filed Feb. 13, 1969, Ser. No. 799,024
Int. Cl. B01d *3/38, 15/06*
U.S. Cl. 210—32 **4 Claims**



Apparatus and method for recovering organic compounds present in aqueous streams at concentrations between 50 and 5,000 parts per million is disclosed. The process is continuous in that alternate adsorbers are interchangeably used. Economic steam desorption of high-boiling compounds is permitted by use of a thermocompressor to recycle regenerating steam through the adsorbers. Steam condensing in a separator is kept to a minimum in order to obtain the highest possible organic content in the condensate.

3,625,887

NONCAKING UREA COMPOSITION CONTAINING ASBESTOS, ALUMINA OR SILICA HAVING AN ULTIMATE PARTICLE SIZE OF 2–20 MICRONS AND THE METHOD OF PREPARATION

Heyman C. Duecker, Rockville, and Harry C. Heimlinger, Jr., Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed Mar. 15, 1968, Ser. No. 713,309
Int. Cl. C07c *127/00;* **C09k** *3/00*
U.S. Cl. 252—1 **6 Claims**

A fine-sized noncaking urea is prepared by feeding urea into a fluid energy mill under low moisture conditions.

3,625,888

OXYGEN SCAVENGER SYSTEM

Derek Redmore, Ballwin, and Jackie Joe Marr, Manchester, both of Mo., assignors to Petrolite Corporation, Wilmington, Del.

Filed June 26, 1968, Ser. No. 740,022
Int. Cl. C23f *11/10, 11/16;* E21b *43/16*
U.S. Cl. 252—8.55 D 13 Claims

A composition of matter suitable as an oxygen scavenger which is characterized as a solution of salts of a carbonyl (such as an aldehyde and/or a ketone) bisulfite addition product containing minor amounts of a transition metal such as a metal of the Iron Period of the Periodic Table, i.e., iron, cobalt, nickel, but most preferably cobalt. The oxygen scavenger may be employed to inhibit corrosion particularly in oil well waterflooding processes.

3,625,889

WELL COMPLETION FLUIDS

Claud D. Branscum, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Aug. 28, 1969, Ser. No. 853,938
Int. Cl. C10m *3/22;* C08b *21/30*
U.S. Cl. 252—8.5 A 2 Claims

Aqueous high-density well drilling, completion and packer fluids containing calcium chloride, a water soluble salt of carboxyalkyl cellulose and a gum produced by the action of a Xanthomonas bacterium on sugars.

3,625,890

PROCESSES AND COMPOSITIONS FOR THE TREATMENT OF TEXTILE MATERIALS

John A. Sramek, Racine, Wis., assignor to S. C. Johnson & Son, Inc., Racine, Wis.

Filed June 3, 1969, Ser. No. 830,093
Int. Cl. D06m *13/20*
U.S. Cl. 252—8.6 17 Claims

Processes for reducing or eliminating the accumulation of static electric charges on carpeting and other textile fibers which comprise treating such fibers with an alkaline polymethacrylic acid mixture, the mixture being prepared by admixing polymethacrylic acid with an alkali metal hydroxide to provide a pH of at least about 9; compositions containing such polymethacrylic acid mixtures adapted to effect such reduction or elimination of static electric charges, and methods for preparing and using such compositions.

3,625,891

WASH CYCLE FABRIC SOFTENERS AND METHOD OF PREPARING AND USING SAME

Milton M. Waldman, Western Springs, and Andrea E. Mariahazy, Westchester, both of Ill., assignors to Armour-Industrial Chemical Company, Chicago, Ill.

Filed Apr. 18, 1968, Ser. No. 722,171The portion of the term of the patent subsequent to Apr. 7, 1987, has been disclaimed.
Int. Cl. D06m *13/46;* C11d *1/02, 1/66*
U.S. Cl. 252—8.8 9 Claims

Fabric softener compositions which are compatible with anionic and nonionic detergents, and methods of their preparation and use are disclosed. The softening agent of the compositions comprises certain combinations of three particular types of quaternary ammonium compounds as, for example, the combination of about 25 percent dimethyl diphenylstearyl ammonium chloride, 30–45 percent dimethyl hydrogenated tallow: C_{11}–C_{15} sec-alkyl ammonium chloride and 45–30 percent dimethyl dihydrogenated tallow ammonium chloride.

3,625,892

HYDRAULIC FRACTURING OF TILTED SUBTERRANEAN FORMATIONS

David J. Watanabe, Orange, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Original application Mar. 25, 1966, Ser. No. 537,405, now Patent No. 3,416,606, dated Dec. 17, 1968. Divided and this application May 24, 1968, Ser. No. 740,404
Int. Cl. E21b *43/26*
U.S. Cl. 252—8.55 R 11 Claims

A high-density particulate solid diverting agent comprising discrete solid particles of a dispersion of finely divided solid inorganic weighting material in an oil-soluble, water-insoluble homogeneous solid binder comprised of paraffin wax and polymer. Also, a mixed-density particulate solid diverting agent comprising a heterogeneous mixture of low- and high-density solid oil-soluble, water-insoluble particles.

3,625,893

LUBRICATING COMPOSITIONS HAVING IMPROVED OXIDATION STABILITY AND ANTIRUST PROPERTIES

James H. T. Brook, Birkenhead, Cheshire, England, and Joyce Williams, Mold, Flintshire, Wales, assignors to Shell Oil Company, New York, N.Y.

Filed Nov. 1, 1968, Ser. No. 772,840
Claims priority, application Great Britain, Nov. 6, 1967, 50,317/67
Int. Cl. C10m *1/48, 1/24, 1/20*
U.S. Cl. 252—32.7 6 Claims

Lubricating oil compositions comprising essentially a major amount of lubricating oil and a minor amount of a mixture of basic group II metal salts of aromatic carboxylic acids and naphthenic acids have improved oxidation stability and antirust properties. The composition optionally contains zinc dialkyldithiophosphate.

3,625,894

ANTICORROSIVE FOR LUBRICANTS

Gunter Koenig, and Helmut Landau, both of Gersthofen, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Apr. 16, 1968, Ser. No. 721,619
Claims priority, application Germany, May 13, 1967, F 52402
Int. Cl. C10m *1/40*
U.S. Cl. 252—33.4 1 Claim

Lubricants can be combined with an anticorrosive consisting of from 67 to 99 percent by weight of an alkaline earth metal petroleum sulfonate and/or an oil-soluble alkaline earth metal salt of a fatty acid having from 10 to 36 carbon atoms, and/or an oil-soluble alkaline earth metal salt of an alkyl-sulfamido-carboxylic acid, and from 33 to 1 percent by weight of benzotriazol.

3,625,895

LUBRICANTS CONTAINING HALOGEN-SUBSTITUTED ORGANOSILICON COMPOUNDS

Edgar D. Brown, Schenectady, N.Y., assignor to General Electric Company

Continuation-in-part of application Ser. No. 862,576, Aug. 15, 1969, which is a division of application Ser. No. 666,948, Sept. 11, 1967, now abandoned , Original application Nov. 3, 1969, Ser. No. 873,511, now Patent No. 3,557,175, which is a continuation-in-part of application Ser. No. 666,948, Sept. 11, 1967, now abandoned. Divided and this application Aug. 31, 1970, Ser. No. 68,594
Int. Cl. C10m *1/52*
U.S. Cl. 252—49.6 9 Claims

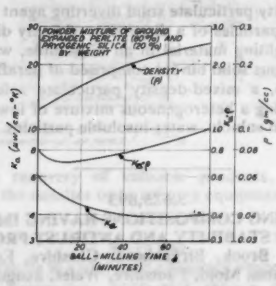
Lubricating compositions useful for lubricating high-temperature alloys are prepared by adding organosilicon compounds containing silicon-bonded ethyl groups substituted with iodine, with bromine or chlorine, and with alkoxy, acyloxy or hydroxy groups to oils of lubricating viscosity.

3,625,896

THERMAL INSULATING POWDER FOR LOW-TEMPERATURE SYSTEMS AND METHODS OF MAKING SAME

Bradley S. Kirk, Plainfield, and Chester B. De Savigny, Millington, both of N.J., assignors to Air Reduction Company, Incorporated, New York, N.Y.

Filed June 7, 1968, Ser. No. 735,465
Int. Cl. F16l *59/02, 59/08;* B32b *19/04*
U.S. Cl. 252—62 14 Claims



A thermal insulation powder for a cryogenic-evacuated insulation system, consists of an improved mixture of an opacifying powder and a low-density powder having high resistance to heat conduction. Ground expanded perlite is a preferred example of the opacifier, and pyrogenic silica is a preferred example of the low-density powder, the latter being in the form of agglomerates between the comparatively coarse particles of the perlite, and making up about one-half or more of the mixture by volume. This preferred mixture is compatible with oxygen. More effective interposition of the agglomerates between the opacifier particles for improving thermal insulation properties is achieved by impact-milling the mixture for a definite period of time.

3,625,897

LIQUID DEVELOPING AGENT FOR ELECTROPHOTOGRAPHY

Hazime Machida, and Zenjiro Okuno, both of Tokyo, Japan, assignors to Kabushiki Kaisha Ricoh, Tokyo, Japan

Filed June 11, 1969, Ser. No. 832,416
Claims priority, application Japan, June 19, 1968, 43/41885
Int. Cl. G03g *9/04*
U.S. Cl. 252—62.1 6 Claims

A liquid developing agent for electrophotography comprising a mixed solution consisting of an insulating carrier liquid containing an organic substance having carboxyl group and a colored solution prepared by solving or dispersing a dye and an amine in a polar solvent which is not miscible with the aforementioned carrier liquid.

3,625,898

METHOD OF MANUFACTURING A CERAMIC, POLYCRYSTALLINE, MAGNETICALLY ANISOTROPIC SPINEL FERRITE BODY

Ferdinand Clemens Maria Driessens, Nijmegen; Henricus Francisous Johannes Ignatius Giller, Emmasingel, Eindhoven, and Dirk Veeneman, Emmasingel, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 8, 1969, Ser. No. 856,187
Claims priority, application Netherlands, Sept. 7, 1968, 6812815
Int. Cl. C01g *49/00;* C04b *35/20*
U.S. Cl. 252—62.58 9 Claims

The manufacture of a ceramic, polycrystalline, magnetically anisotropic spinel ferrite bodies by sintering a mixture containing crystals of a compound $PbMe'''Fe_{10}'''O_{27}$ and/or of the compound $PbFe_{12}'''0_{19}$, the magnetic preferential axes or magnetic preferential planes of said crystals in said mixture being, to a certain extent, oriented mutually parallel, in which the above-mentioned spinel ferrite bodies are formed as the product of a topotactical reaction which mainly occurs according to the equation

$PbMe_2'AllFe_{16}'''O_{27}+6Me''O$
$6Me''Fe_2O_4+2Me'''Fe_2'''0_4+PbO$

and/or according to the equation

$PbFe_{12}'''0_{19}+6Me''0$ $6Me''Fe_2'''0_4+Pb0.$

wherein Me'' and Me''' both represent at least one (possibly all the same) representative of the group formed by the bivalent elements Fe'', Ni'', Mn'', Co'', Zn, Mg, Cu'' and the bivalent combination $(Li^{I}+Fe'''/2$ and wherein Fe''' may be partly replaced by Al and/or Cr''' and/or at least one of the trivalent combinations $(Me''+Ti^{IV}(/2$ and $(Me''+Sn^{IV})/2$

3,625,899

WATER-INSENSITIVE HYDRAULIC FLUIDS CONTAINING BORATE ESTERS

Arthur W. Sawyer, Hamden, and David A. Csejka, Orange, both of Conn., assignors to Olin Mathieson Chemical Corporation

Continuation-in-part of application Ser. No. 653,338, July 14, 1967. This application Apr. 1, 1968, Ser. No. 717,996
Int. Cl. C09k *3/00;* C10m *3/48*
U.S. Cl. 252—75 24 Claims

A water-insensitive hydraulic fluid composition comprising from about 54.5 to about 92 percent by weight of at least one borate ester, from 0 to about 20 percent by weight of a polyoxyalkylene glycol and from about 3 to about 43 percent by weight of a glycol monoether or diether diluent together with minor amounts of an alkaline buffer and an antioxidant, if desired. Such water-insensitive hydraulic fluids are high boiling compositions suitable for use as brake fluids.

3,625,900

PREFUSED DESCALING BATH CONSTITUENT AND METHOD OF MAINTAINING A CONSTANT CHEMICAL COMPOSITION OF A BATH

Robert H. Shoemaker, Royal Oak, and William G. Wood, Grosse Pointe Park, both of Mich., assignors to Kolene Corporation, Detroit, Mich.

Filed Jan. 22, 1968, Ser. No. 699,342
Int. Cl. C23b *1/06;* C23g *1/28*
U.S. Cl. 252—87 19 Claims

A prefused and solidified salt for use in forming a metal-conditioning bath and for additives to existing baths. The slat is a uniform solid solution of an alkali metal hydroxide, a nitrate salt, and water.

3,625,901

SURFACE ACTIVE DISHWASHING RINSE AIDS

Larry M. Rue, Inver Grove Heights; Dale W. Groth, Bloomington; Alan W. Leipnitz, Burnsville; Thomas E. Brunelle, West St. Paul, and Samuel B. Crecelius, Mendota Heights, all of Minn., assignors to Economics Laboratory, Inc., St. Paul, Minn.

Filed Dec. 2, 1969, Ser. No. 881,614
Int. Cl. B01f *17/42;* C11d *1/825*
U.S. Cl. 252—89 1 Claim

Surfactants having a combination of foaming, defoaming and sheeting properties desired for use as dishwashing rinse aids which are comprised of condensation products of alkylene oxides with tall oil heads.

3,625,902

METHOD OF PREPARING AGGLOMERATED DETERGENT COMPOSITION

Clark A. Sumner, Downey, Calif., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Oct. 11, 1968, Ser. No. 764,634The portion of the term of the patent subsequent to Sept. 28, 1988, has been disclaimed.
Int. Cl. C11d 7/56
U.S. Cl. 252—99 5 Claims

A method of producing agglomerates of detergent ingredients by charging particulate detergent ingredients into an agglomeration zone and maintaining a falling curtain of said ingredients in said zone, contacting said particulate material in said falling curtain with liquid material to agglomerate said particulate material, maintaining a tumbling bed of agglomerating ingredients at the base of said falling curtain and withdrawing agglomerated material from said agglomeration zone.

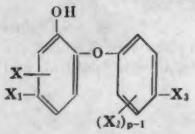
3,625,903

SOAP BAR

James Francis Davies, Bromborough, and Wai Ming Cheng, Ellesmere Port, both of England, assignors to Lever Brothers Company, New York, N.Y.

Filed Apr. 16, 1968, Ser. No. 721,610
Claims priority, application Great Britain, Apr. 27, 1967, 19,548/67
Int. Cl. C11d 3/48
U.S. Cl. 252—107 3 Claims

The discoloration of certain antibacterial compounds, halogenated o-hydroxydiphenyl ethers of the general formula



where X_1 and X_3 are chlorine X and X_2 are H or chlorine and p is a whole number from 1 to 5, in a soap bar is reduced by including in the soap bar from 1 to 15% of free C_{8-22} straight-chain fatty acid.

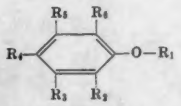
3,625,904

WASHING AGENTS, WASHING ADJUVANTS AND CLEANING AGENTS CONTAINING ANTIMICROBIAL SUBSTANCES

Heinz Gunter Nosler, Monheim Rhineland; Harald Schnegelberger, Hilden Rhineland; Horst Bellinger, Dusseldorf, and Kurt Rehnelt, Dusseldorf, all of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed July 8, 1968, Ser. No. 743,032
Claims priority, application Germany, July 13, 1967, H 63270
Int. Cl. C11d 3/48
U.S. Cl. 252—107 25 Claims

Antimicrobial washing and washing adjuvant preparations comprising (a) from 1 percent to 30 percent by weight of a substituted phenyl ether antimicrobial component of the formula



wherein R_1 is a member selected from the group consisting of alkyl having one to four carbon atoms, alkenyl having one to four carbon atoms, haloalkyl having one to four carbon atoms, hydroxyalkyl having one to four carbon atoms and alkoxyalkyl having one to four carbon atoms and R_2, R_3, R_4, R_5 and R_6 are members selected from the group consisting of hydrogen, alkyl having one to four carbon atoms, halogen, trifluoromethyl, phenyl and nitro and (b) from 99 percent to 70 percent by weight of customary water-soluble components of washing and washing adjuvant preparations, wherein solvents may also be present in addition to components (a) and (b).

3,625,905

DETERGENT COMPOSITION HAVING SOFTENING PROPERTIES

Marvin C. Weast, Anaheim, Calif., assignor to Purex Corporation, Ltd., Lakewood, Calif.

Filed Nov. 22, 1967, Ser. No. 684,959
Int. Cl. C11d 9/10, 3/065
U.S. Cl. 252—109 19 Claims

Simultaneous cleansing and softening of fabrics is achieved by use of an aqueous solution of a mixture of synthetic organic noncationic detergent and an alkali metal salt of isostearic acid as the fabric wash water.

3,625,906

SOAP-DETERGENT TABLETS

Allan Alsbury, and Dennis Parker Barrett, both of Wirral, England, assignors to Lever Brothers Company, New York, N.Y.

Filed Oct. 29, 1968, Ser. No. 771,613
Claims priority, application Great Britain, Nov. 16, 1967, 52,254/67
Int. Cl. C11d 1/14, 9/32, 9/48
U.S. Cl. 252—121 7 Claims

Personal washing tablets consisting essentially of a soap and an alkali metal or alkaline earth metal sulfate of a primary alcohol 10–75 percent of the molecules of said alcohol being branched, and wherein the soap content is 90–40 percent by weight of the combined contents of the soap and the sulfate.

3,625,907

CORROSION INHIBITED PAINT REMOVING COMPOSITION

Myer Rosenfeld, Baltimore, and Troy R. Nichols, Bel Air, both of Md., assignors to The United States of America as represented by the Secretary of the Army

Filed Dec. 1, 1969, Ser. No. 881,266
Int. Cl. C09d 9/04; C23f 11/18
U.S. Cl. 252—138 8 Claims

A paint-removing formulation comprising a mixture of: sodium metasilicate pentahydrate, trisodium phosphate dodecahydrate, monosodium phosphate monohydrate, dodecylbenzene sodium sulfonate in conjunction with a small amount of an inhibitor consisting of sodium stannate tetrahydrate or potassium stannate tetrahydrate. In the alternative, the anhydrous forms of the above components may be utilized.

3,625,908

COMPOSITION FOR CLEANING PHOTOGRAPHIC EQUIPMENT

Irving J. Magin, Rochester, N.Y., assignor to Itek Corporation, Lexington, Mass.

Filed June 24, 1968, Ser. No. 739,173
Int. Cl. C11d 7/02, 7/08
U.S. Cl. 252—142 8 Claims

An acidic aqueous cleaning solution for removing deposits from photographic equipment, especially continuous processing photographic equipment. The composition comprises a solution and preferably an aqueous solution of hydrogen ions in a concentration of from 0.10 to 8.0 moles per liter, ammonium ions in a concentration of from 0.01 to 1.0 moles per liter, and sulfate ions in a concentration of from 0.10 to 6.0 moles per liter. The compositions of this in-

vention are especially useful for removing deposits from continuous diffusion transfer processing equipment. These deposits possibly comprise lime introduced with tap water mixed with photographic chemicals such as dissolved silver halides and gelatin.

3,625,909

LOW-FOAMING, STAIN-REMOVING AGENTS FOR TEXTILES

Markus Berg, Dusseldorf, Holthausen, and Josef Hartenstein, Hilden, Rhineland, both of Germany, assignors to Henkel & Cie GmbH, Dusseldorf-Holthausen, Germany

Filed Oct. 5, 1967, Ser. No. 672,964
Claims priority, application Germany, Nov. 18, 1966, H 61018
Int. Cl. C11d *1/18, 1/12*
U.S. Cl. 252—153 5 Claims

The present invention relates to liquid, low-foaming, spot-removing agents consisting of

A. from 25 percent to 45 percent by weight of a water-soluble compound of the formula

$R_1—(O—CH_2—CH_2)_x—(O—CH—CH_2)_y—OH$ wherein R_1 represents a straight-chained hydrocarbon having from 16 to 24 carbon atoms selected from the group consisting of alkyl, alkenyl and alkadienyl, and x and y represent integers of from 20 to 40,

B. from 25 percent to 45 percent by weight of a substantially water-insoluble compound of the formula

$R_2—(O—CH_2—CH_2)_z—OH$ wherein R_2 represents a straight-chained hydrocarbon having from 14 to 22 carbon atoms selected from the group consisting of alkyl, alkenyl and alkadienyl, and z represents an integer of from one to eight,

C. from 2 percent to 10 percent by weight of a hydrotropic alkali metal salt of an alkylated benzenesulfonate, the the alkyl groups in said alkylated benzenesulfonate having from one to three carbon atoms,

D. from 1 percent to 15 percent by weight of water, and

E. from 2 percent to 50 percent by weight of organic solvents having boiling points between the temperatures of 50° C. and 350° C., said liquid, low-foaming spot-removing agent having a viscosity not exceeding 500 cP at a temperature of 20° C.

3,625,910

HYDROGENATED OLEFIN SULFONATE DETERGENT BARS

William Alan Sweeney, San Rafael, and Gar Lok Woo, Tiburon, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed July 29, 1968, Ser. No. 748,188
Int. Cl. C11d *1/12*
U.S. Cl. 252—554 11 Claims

Nonsoap detergent toilet bars are prepared from a complex mixture of hydrogenated olefin sulfonates containing from 10 to 24 carbon atoms and a plasticizing amount of water.

3,625,911

POLYAMIDE/IMIDE POLYMER DERIVED FROM TRIMELLITIC ANHYDRIDE AND ORGANIC DIISOCYANATE AND THE ENAMELING OF WIRE THEREWITH

Edward G. Redman, Cincinnati, Ohio, and Jack S. Skinner, Pittsburgh, Pa., assignors to Mobil Oil Corporation

Continuation-in-part of application Ser. No. 506,837, Nov. 8, 1965, now abandoned. This application June 28, 1968, Ser. No. 741,228
Int. Cl. C08g *22/04, 22/32*
U.S. Cl. 260—30.2 6 Claims

Wire coating solutions are provided by reacting trimellitic anhydride with an organic diisocyanate in substantially equimolar proportions, the reaction being carried out at a moderate temperature up to about 275° F. in organic solvent solution medium to produce an amide reaction product having a single anhydride group and a single isocyanate group. The amide-forming reaction is continued until the theoretical amount of carbon dioxide is removed. The reaction product is then blocked with a monofunctional blocking agent such as phenol in order to block the isocyanate functionality and convert the anhydride functionality to a carboxy ester. Polymerization is then carried out by raising the temperature to progressively unblock the isocyanate functionality for reaction with the free carboxy groups which are available. This polymerization produces an organic solvent-soluble polyamide polymer in solution in the solvents used. When the polyamide polymer is coated on a base such as wire and baked, the phenol blocking agent is removed and insolubilization takes place primarily by imide formation.

3,625,912

POLYIMIDE LACQUERS

Gerald G. Vincent, Barrington, and Thomas E. Anderson, Palatine, both of Ill., assignors to DeSota, Inc., Des Plaines, Ill.

Filed July 26, 1968, Ser. No. 747,799
Int. Cl. C08g *51/26, 51/44, 20/32*
U.S. Cl. 260—30.2 12 Claims

A bis-maleimide is reacted with a diprimary amine in organic solvent medium at a temperature of about 150° C. and present in molar proportions of about 1:1 to produce organic solvent-soluble polymers which thermoset on baking.

3,625,913

"N'-ALKYL, AND N'-ARYL-N-FLUORENYL-P-PHENYLENE-DIAMINES AS ANTIOZONANTS IN NATURAL AND SYNTHETIC DIENE RUBBERS"

Jerry Donald Hunt, Cuyahoga Falls, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 22, 1969, Ser. No. 827,059
Int. Cl. C08f *45/28, 45/60*
U.S. Cl. 260—33.6 AQ 9 Claims

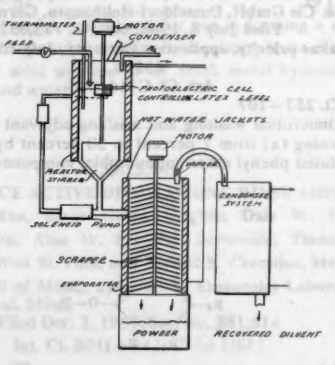
N'-alkyl- and N'-aryl-N-fluorenyl-p-phenylenediamines are new compounds. They are antiozonants in natural and synthetic diene rubbers.

3,625,914

CONTINUOUS PROCESS FOR MAKING STABILIZED DISPERSION OF POLYMER IN ORGANIC LIQUID BY POLYMERIZING ETHYLENICALLY UNSATURATED MONOMER

Morice William Thompson, Maidenhead, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 24, 1968, Ser. No. 739,168
Claims priority, application Great Britain, June 30, 1967, 30,353/67
Int. Cl. C08f *47/20*; C08j *1/48*
U.S. Cl. 260—34.2 6 Claims



In a continuous process of making polymer in disperse form, ethylenically unsaturated monomer is fed diffusely, together with a dispersion stabilizer and an organic liquid,

into the upper portion of a reaction mixture comprising a dispersion of polymer in the organic liquid contained in a reaction vessel of greater height than average width. A corresponding amount of polymer dispersion is drawn off from the bottom of the vessel. The reaction mixture may be stirred to prevent sedimentation of the disperse polymer but the upper and lower portions of the reaction mixture should not be mixed.

3,625,915

ANTISTATIC STYRENE/ACRYLONITRILE-TYPE INTERPOLYMER COMPOSITIONS

Michel Gubler, Meurchin, and Joseph Guillon, Henin-Lietard, both of France, assignors to Societe Monsanto, Paris, France

Filed Feb. 9, 1968, Ser. No. 704,241

Claims priority, application Great Britain, Feb. 17, 1967, 7,752/67

Int. Cl. C08f *19/18, 41/12, 45/02*

U.S. Cl. 260—41 R **11 Claims**

The electrostatic properties characteristically associated with styrene/acrylonitrile-type interpolymers is greatly reduced by blending with such polymers a combination of certain alkanolamines and certain polyalkylene glycols.

3,625,916

SYNTHETIC PLASTIC DENTAL ADHESIVE

George V. Newman, West Orange, N.J., assignor to Ortho International Services Inc., Wilmington, Del.

Filed July 3, 1968, Ser. No. 742,126

Int. Cl. A61k *5/00;* **C08f** *29/36, 45/04*

U.S. Cl. 260—41 A **10 Claims**

A dental adhesive for securing orthodontic appliances to the tooth which is limitedly resilient and nonfriable, which permits removal of the appliance by steady pressure without dangerous impact and which attenuates dental decay at and about the interface between the appliance and the tooth; the adhesive comprising synthetic plastics in both a liquid and solid phase which polymerize upon mixing of the phases to from a relatively rapidly setting adhesive.

3,625,917

ORGANOSILICON MATERIALS

Bruce A. Ashby, Schenectady, N.Y., assignor to General Electric Company

Original application Dec. 16, 1963, Ser. No. 330,607, now Patent No. 3,360,538. Divided and this application Sept. 20, 1967, Ser. No. 679,948

Int. Cl. C08f *11/04;* **C08g** *51/04*

U.S. Cl. 260—46.5 **3 Claims**

Organopolysiloxane cyclics and polymers are provided which are substituted with fluorinated monovalent hydrocarbon radicals of the formula, $H(C_2F_4)_nCHR—CR_2$ attached to silicon by carbon silicon linkages, where R is selected from hydrogen and a lower alkyl radical, and *n* is an integer equal to from 1 to 3, inclusive. The above, organosiloxane materials substituted with fluorinated monovalent hydrocarbon radicals can be employed to make a variety of oil resistant polymers and copolymers.

3,625,918

ADDUCTS OF POLYEPOXIDES AND CYCLOALIPHATIC DIPRIMARY DIAMINES AND AS CURING AGENTS IN EPOXY RESIN COMPOSITIONS

Alfred Heer, Basel, and Peter Ruf, Binningen, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed June 18, 1968, Ser. No. 737,833

Claims priority, application Switzerland, June 22, 1967, 8944/67

Int. Cl. C08g *30/14*

U.S. Cl. 260—47 EN **10 Claims**

Process for the manufacture of new adducts of polyepoxides and polyamines suitable for use as curing agents for epoxy resins characterized in that (1) a 1,2-polyepoxide compound is reacted with (2) a cycloaliphatic-aliphatic diprimary diamine in which the first primary amino group is located on an aliphatic side-chain and the second primary amino group is bonded to an endocyclic carbon atom of the cycloaliphatic ring, in a quantity ratio of 0.6 to 1.2 mols, preferably 0.7 to 1.0 mols, of the diamine (2) per 1 epoxide equivalent of the polyepoxide compound (1), with heating.

3,625,919

PROCESS FOR THE PREPARATION OF DIAZOTIZED VINYLPHENOL POLYMERS HAVING PHOTOTROPIC PROPERTIES

Hiroyoshi Kamogawa, 809, Mizonokuchi, Kawasaki-shi, and Masao Kato, 955-10, Shimonagaya-cho-Sherigaya, Minami-ku, Yokohama, both of Japan

Filed Feb. 8, 1968, Ser. No. 703,864

Claims priority, application Japan, Feb. 10, 1967, 42/8719

Int. Cl. C08f *7/10*

U.S. Cl. 260—47 U **9 Claims**

Polymers having optical specificity which have a saturated hydrocarbon polymer chain and pendant phenol groups which are the coupled reaction products of phenol and a diazonium salt. These polymers may be prepared by coupling a diazonium salt with vinylphenol and then copolymerizing with at least one vinyl compound. Alternatively, a homopolymer formed from the vinylphenol monomer or a copolymer formed from the vinylphenol monomer with another vinyl monomer are reacted with a diazonium salt to couple said salt with the phenol groups.

3,625,920

PROCESS FOR THE PRODUCTION OF CARBONIC ACID POLYESTERS

Jan Borkowski, Warszawa, Poland, assignor to Instytut Tworzyw Sztucznych Warszawa, UL., Rydygiera, Poland

Filed May 3, 1968, Ser. No. 726,544

Claims priority, application Poland, May 5, 1967, 120,392

Int. Cl. C08g *17/13*

U.S. Cl. 260—47 **8 Claims**

Process for producing polycarbonate by transesterification reaction between aromatic monohydroxycarbonic ester and dihydroxy diphenyl alkane or phenol adduct thereof in presence of alkali metal salt of fluoroboric acid and/or hydroxyfluoroboric acid as catalysts and stabilizers.

3,625,921

POLYURETHANE COATING COMPOSITIONS PREPARED FROM 4,4'-METHYLENE BIS(CYCLOHEXYLISOCYANATE) AND POLYETHER TRIOL BLENDS

George S. Wooster, Hamburg, and Frank M. Delgado, Tonawanda, both of N.Y., assignors to Allied Chemical Corporation, New York, N.Y.

Filed May 15, 1968, Ser. No. 729,378

Int. Cl. C08q *22/06*

U.S. Cl. 260—77.5 AT **1 Claim**

Novel polyurethane coating compositions characterized by excellent curing properties are prepared from 4,4'-methylene bis(cyclohexylisocyanate) and mixtures of polyether triols.

3,625,922

METHOD FOR PREVENTING ELECTRIFICATION OF SYNTHETIC HIGH POLYAMIDES

Satoshi Ando, Osaka, and Kyoichi Fujimura, Ibaraki, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan and Snia Viscosa Societa Nazionale Industria Applicazioni Viscosa, Milan, Italy

Filed Apr. 25, 1968, Ser. No. 724,266

Claims priority, application Japan, May 5, 1967, 42/28563

Int. Cl. C08g *20/38*

U.S. Cl. 260—78 R **2 Claims**

Synthetic high polymers, such as polyamides, polyolefins, polystyrenes, polyvinyl chloride, polyvinylidene chloride, copolymers thereof and polymer blends thereof can be prevented from electrification by incorporating homogeneously imidazole or its derivatives into said high polymers. The

amount of the imidazole or a derivative thereof added is 0.005 to 20 percent by weight based on the amount of the high polymer.

3,625,923

PROCESS FOR PRODUCING CROSSLINKED POLYAMIDES FROM LACTAMS

Rene Marie-Joseph Roberts, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 16, 1969, Ser. No. 842,381
Int. Cl. C08g *20/10*
U.S. Cl. 260—78 L 2 Claims

Cross-linked polyamides are produced by the noncatalytic polymerization of a lactam and a bis-lactam. The polyamides have known utilities.

3,625,924

ORIENTED FILMS OF METHYL VINYL ETHER-MALEIC ANHYDRIDE COPOLYMERS

Nathan D. Field, Allentown, Pa., and Donald H. Lorenz, Basking Ridge, N.J., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 4, 1969, Ser. No. 882,308
Int. Cl. C08f *17/00*
U.S. Cl. 260—78.5 T 12 Claims

Oriented films of polymers of methyl vinyl ether and maleic anhydride are disclosed. Additionally, terpolymers of methyl vinyl ether, maleic anhydride and higher alkyl vinyl ethers are disclosed. The films can be uniaxially, biaxially, or multiaxially oriented.

3,625,925

SYNTHESIS OF POLYTHIOL POLYMER INTERMEDIATES FROM POLYUNSATURATED HYDROCARBONS

Alexis A. Oswald, Mountainside; Wolfgang H. Mueller, Elizabeth, and Daniel N. Hall, Linden, all of N.J., assignors to Esso Research and Engineering Company

Filed Sept. 6, 1967, Ser. No. 665,728
Int. Cl. C08g *23/00*
U.S. Cl. 260—79 8 Claims

Polythiols having more than two terminal and/or pendant thiol groups per polymer molecule are formed by the free radical catalyzed addition of a monomer system made up of either hydrogen sulfide or a dithiol alone or in combination with an acetylenic compound to a polyolefin having at least three olefin sites. The polyolefin is preferably a triterminal olefin. The polythiol products are liquid, essentially gel-free materials having number average molecular weights varying from 200 to 30,000. The polyfunctional prepolymers of the invention can be cured to stable three-dimensional networks with inexpensive bi-functional oxidants such as lead dioxide. Additionally, prepolymer compositions having 3 or more pendant or terminal thiol groups per molecule when combined with polyfunctional organic reagents, such as diepoxides, form stable, high-tenacity adhesive systems.

3,625,926

ACETAL-CONTAINING MONOMERS AND NEW THERMOSETTING POLYMERS DERIVED THEREFROM

Rostyslaw Dowbenko, Gibsonia, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Original application Apr. 14, 1966, Ser. No. 542,446, now Patent No. 3,530,167, dated Sept. 22, 1970. Divided and this application Dec. 22, 1969, Ser. No. 887,393
Int. Cl. C07c *69/54*; C08f *15/10*
U.S. Cl. 260—78.5 B 5 Claims

Novel acetal-containing compounds which are useful in thermosetting polymers and coating compositions are obtained by reacting a vinyloxy compound with a polymerizable ethylenically unsaturated hydroxyl-containing material.

3,625,927

HYDROGENATION CATALYSTS AND A PROCESS FOR HYDROGENATING POLYMERS BY MEANS OF THESE CATALYSTS

Toshio Yoshimoto; Seiya Kaneko; Tsuneaki Narumiya, and Hiroshi Yoshii, all of Tokyo, Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

Filed June 13, 1968, Ser. No. 736,580
Claims priority, application Japan, June 21, 1967, 42/39792
Int. Cl. C08d *5/00*; C08f *1/88, 27/25*
U.S. Cl. 260—85.1 7 Claims

A catalyst for hydrogenating a high molecular weight polymer having hydrogenatable unsaturated bonds, which is suitable for hydrogenation of said polymer in a viscous solution form and comprises a reaction product of (1) a metal chelate compound of nickel, cobalt or iron with (2) an organic metallic reducing agent; in said chelate compound, the chelating agent should be attached to said metal through a pair of a nitrogen atom and an oxygen atom; the hydrogenation process of said polymer by means of said catalyst.

3,625,928

ACTIVATION OF OLEFIN POLYMERIZATION CATALYST

Philippe Mornet, Pau; Jean Teitgen, Arthez-de-Bearn, and Gilbert Marie, Pau, all of France, assignors to Societe Nationale Des Petroles D'Aquitaine, Courbevoie, France

Filed Aug. 8, 1968, Ser. No. 751,044
Claims priority, application France, Aug. 9, 1967, 117338
Int. Cl. C08f *1/56, 15/04*
U.S. Cl. 260—88.2 16 Claims

There is provided a novel class of activators for catalyst systems comprising a transition metal compound and a reducing agent suitably an aluminum alkyl or haloalkyl. There is also provided a novel catalyst system containing such activators. These activators are halosulfonyl and halosulfinyl heterocyclic compounds containing sulfur in the ring.

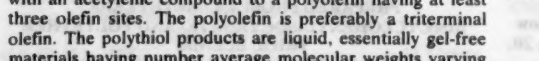
3,625,929

POLYFLUOROALKENYLALKOXY ACRYLATES AND POLYMERS THEREOF

Eugene C. Stump, Jr.; Paul Daniel Schuman, and Paul Tarrant, all of Gainesville, Fla., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed July 6, 1970, Ser. No. 052,681
Int. Cl. C08f *3/62, 15/16*
U.S. Cl. 260—89.5 3 Claims

This invention is directed to novel polyfluoroalkenylalkoxy acrylate monomers represented by the formula:



where "R" is H or CH_3 and "R_f" is a perfluorinated alkyl chain containing three to 14 carbon atoms, and polymers of these monomers which are useful in preparing oil and water repellent coatings.

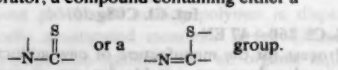
3,625,930

ANAEROBIC COMPOSITION AND PROCESS FOR BONDING NONPOROUS SURFACES, SAID COMPOSITION COMPRISING AN ACRYLIC MONOMER A PEROXY INITIATOR AND A BONDING ACCELERATOR

Alex S. Toback, West Hartford, Conn., and William E. Cass, Wayland, Mass., assignors to Loctite Corporation, Newington, Conn.

Filed Dec. 28, 1967, Ser. No. 694,053
Int. Cl. C08f *3/64, 3/66, 15/18*
U.S. Cl. 260—89.5 13 Claims

The speed of cure of a peroxy initiated acrylate based adhesive composition is markedly increased by pretreating one or more of the surfaces to be bonded with, as an organic bonding accelerator, a compound containing either a



group.

3,625,931

ANTISTATIC THERMOPLASTIC RESIN

Masatomo Ito, Yokohama; Soyao Moriguchi, Kawasaki; Junji Yotsuyangi, Yokohama, and Masao Miyamoto, Kohza-gun, all of Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan and Japan Olefin Chemicals Co., Ltd., Tokyo, Japan, part interest to each

Filed Apr. 29, 1970, Ser. No. 33,075
Claims priority, application Japan, May 6, 1969, 44/34051
May 6, 1969, 44/34052; May 6, 1969, 44/34053
Int. Cl. C08f *45/00*
U.S. Cl. 260—92.8 A 10 Claims

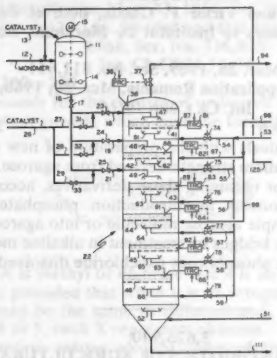
A composition of matter comprising a thermoplastic resin and, as an antistatic agent, N,N'-substituted xylylene diamine. Because of a stability of the antistatic agent used, no fuming phenomenon occurs during fabrication of the composition, and the resulting fabricated articles have good antistatic properties and are free from surface clouding.

3,625,932

VAPOR PHASE POLYMERIZATION OF VINYL CHLORIDE IN A MULTIPLE STAGE FLUIDIZED BED REACTOR

Kenneth J. Green, Bartlesville, Okla., assignor to Phillips Petroleum Company

Filed Dec. 26, 1967, Ser. No. 693,263
Int. Cl. C08f *3/30*
U.S. Cl. 260—92.8 6 Claims



Vinyl chloride, alone or with a suitable comonomer, is continuously polymerized under liquid phase bulk conditions in an agitated reactor to a solid polymer content of about 15 weight percent polymer. A portion of the reaction effluent is continuously or periodically withdrawn from the agitated reactor and flashed into a multiple stage gas-phase fluidized bed reactor wherein monomer is employed as the fluidizing gas. Monomer gas is withdrawn from the fluidized bed reactor and a portion thereof is reintroduced into the fluidized bed reactor as the fluidizing gas. An additional portion of the withdrawn monomer gas is condensed and flashed into one or more of the stages within the fluidized bed reactor at a rate responsive to the temperature of the respective stage, thereby removing heat of reaction. The fluidized bed reactor is provided with a plurality of perforated trays with or without downcomers to maintain the corresponding plurality of fluidized beds of polymer particles. A polymerstream is withdrawn from the fluidized bed reactor and passed to a fluidized bed flash tank. Polymer containing only a small amount of monomer is withdrawn from the flash tank and introduced into a multiple stage fluidized bed purge tank with the fluidizing gas being a purge gas.

3,625,933

DE KHOTINSKY CEMENT

Robert P. Coyle, Anderson, Calif., assignor to U.S. Plywood-Champion Papers Inc., New York, N.Y.

Filed Oct. 29, 1969, Ser. No. 872,416
Int. Cl. C08h *1/02*
U.S. Cl. 260—97 6 Claims

A De Khotinsky-type cement is made by reacting shellac and a polyalcohol in the molten state in the presence of a small amount of a basic catalyst. The cement has excellent adhesive properties and can be used as a thermoplastic filler and as a binder. The tensile strength of steel to wood bonds made with the cement ranges from 400 to 700 p.s.i., and steel to steel bonds of 1,000 p.s.i.

3,625,934

OLIGOMERS OF MIXED TETRAVALENT ELEMENT OXIDES

Jacobus Rinse, P.O. Box 248, Bernardsville, N.J.

Filed July 2, 1968, Ser. No. 741,899
Int. Cl. C09f *1/04*
U.S. Cl. 260—97.5 9 Claims

Oligomers of silicon and a tetravalent metal wherein each tetravalent metal atom is bound to a silicon atom through an oxygen bridge are useful as protective coatings and as intermediates for paint driers and plastic stabilizers.

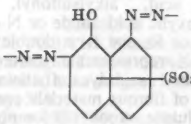
3,625,935

1:2-CHROMIUM COMPLEXES OF A MONOAZO DYESTUFF AND A DISAZO DYESTUFF

Gerhard Back, Loerrach, Germany, and Hans Ulrich Schuetz, Basel, Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed June 5, 1968, Ser. No. 734,525
Claims priority, application Switzerland, June 9, 1968, 8224/67
Int. Cl. C09b *45/06*; D06p *1/10*
U.S. Cl. 260—145 A 8 Claims

Fiber-reactive 1:2-chromium complex compounds containing one atom of metal linked in complex union with a monoazo dyestuff molecule and with a disazo dyestuff molecule containing the grouping



in which n=1 or 2, and which further contain one or several fiber-reactive groupings are suitable for dyeing or printing wool, silk, superpolyamide fibers, and polyhydroxylated fibrous structures such as regenerated cellulose and viscose fibers, linen and cotton. The resulting dyeings are even and have good fastness to light, washing, fulling, decatizing, carbonizing and abrasion. The new dyes are valuable to obtain neutral grey and black tints.

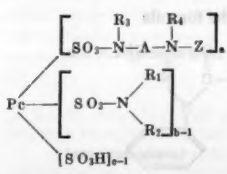
3,625,936

AZOPHTHALOCYANINE DYESTUFFS AND PROCESS FOR PREPARING THEM

Fritz Meininger, and Hartmut Springer, both of Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

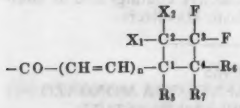
Filed Aug. 7, 1968, Ser. No. 750,783
Claims priority, application Germany, Aug. 12, 1967, P 16 44 225.4
Int. Cl. C09b *45/14, 47/04*; D06p *1/10*
U.S. Cl. 260—147 6 Claims

Water-soluble azophthalocyanine dyestuffs of the formula (1)



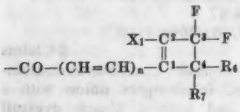
(1)

in which Pc represents phthalocyanine, tegraphenylphthalocyanine, tegrachlorophthalocyanine or the copper, cobalt or nickel compound thereof, A represents the radical $-D-N=N-K-$ or $-K-N=N-D-$, in which D represents the radical of a diazo component of the benzene, naphthalene, diphenyl, diphenylether or stilbene series, and K the radical of a coupling component of the benzene, naphthalene, acetylacetacidarylamide or pyrazolone series, R_1 and R_2 each represents hydrogen or alkyl or aryl or together with the nitrogen atom an alkylene-imine ring, R_3 and R_4 each represents hydrogen or alkyl from 1 to 4 carbon atoms, a, b and c represent integers from 1 to 4, the sum of which being at most 6, and Z represents the grouping of the formula (2)



(2)

or the grouping of the formula (3)



(3)

wherein R_5, R_6 and R_7 stand for hydrogen, chlorine, hydroxyl, alkyl, alkoxy, phenyl, phenoxy, cyano, nitro, sulfonic acid, carboxylic acid alkyl ester, N-monoalkylsulfonic acid amide, N-dialkylsulfonic acid, alkylsulfonyl, phenylsulfonyl, N-monoalkyl carboxylic acid amide or N-dialkylcarboxylic acid amide group, or R_5 and R_7 a double linkage between C^1 and C^4, X_1 and X_2 represent halogen atoms, and *n* represents the integer 0 or 1, said dyestuffs being suitable for the dyeing or printing of fibrous materials consisting of native or regenerated cellulose, wool, silk or polyamides as well as leather, the dyeings or prints obtained on the said fibrous materials being distinguished by high tinctorial strength and by a very good fastness to wet processing and to light.

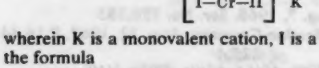
3,625,937

CHROMIUM MIXED COMPLEX AZO DYESTUFFS

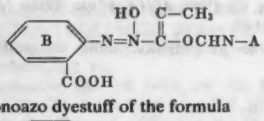
Walter Scholl, Cologne, Stammheim, Germany, assignor to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 19, 1968, Ser. No. 699,021
Claims priority, application Germany, Jan. 26, 1967, F 51352
Int. Cl. C09b *45/06, 45/16;* D06p *1/10*
U.S. Cl. 260—145 B **6 Claims**

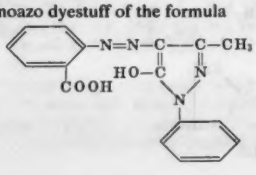
Chromium complex azo dyestuffs suitable for dyeing and printing nitrogen containing fiber materials particularly wool, silk, synthetic polyamides and polyurethanes in shades of yellow to orange color with improved fastness properties of the general formula



wherein K is a monovalent cation, I is a monoazo dyestuff of the formula



and II is a monoazo dyestuff of the formula



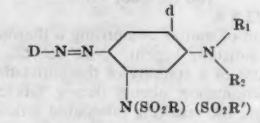
3,625,938

PHENYL-AZO-PHENYL DYESTUFFS

Ved Parkash Kubba, Bombay, India, assignor to Ciba Limited, Basel, Switzerland

Filed Feb. 13, 1968, Ser. No. 705,027
Claims priority, application Switzerland, Feb. 21, 1967, 2515/67
Int. Cl. C07c *107/06;* C09b *29/06*
U.S. Cl. 260—205 **6 Claims**

Monoazo dyestuffs of the formula



wherein D monocyclic or bicyclic diazo residue; *d* is hydrogen, alkyl, or alkoxy; R is alkyl, R′ is alkyl or aryl; and R_1 and R_2 are hydrogen, alkyl, alkyl-carbonyloxy alkyl, hydrogen ethyl or cyanoethyl only one of R_1 and R_2 being hydrogen at one time. The dyestuffs are useful for dyeing polyester fibers.

3,625,939

PREPARATION OF AGAROSE BASED CATION-EXCHANGERS

Horst D. Schell, and Victor F. Ghetie, both of Bucharest, Romania, assignors to Institutul De Biochimie, Bucharest, Romania

Filed Mar. 28, 1969, Ser. No. 811,611
Claims priority, application Romania, Mar. 30, 1968, 57,503
Int. Cl. C08b *19/10*
U.S. Cl. 260—209.6 **3 Claims**

The invention deals with the preparation of new acid ion exchangers of medium strength derived from agarose.

The procedure for obtaining these derivatives, according to the invention, consists in introduction phosphate groups either into the simple agarose molecule or into agarose cross-linked by glyceric bridges by treatment in alkaline medium at about 30° C. with phosphorous oxychloride dissolved in ethyl ether.

3,625,940

NOVEL ANTIBIOTICS OF AGRICULTURAL FUNGICIDES, POLYOXINS J, K AND L: AND PROCESS FOR PREPARING THE SAME

Saburo Suzuki; Kiyoshi Isono, and Junsaku Nagatsu, all of Tokyo, Japan, assignors to Rikagaku Kenkyusho, Oaza Shimonlikura, Yamato-machi, Kitaadachi-gun, Saitama-ken, Japan

Filed June 25, 1968, Ser. No. 739,751
Claims priority, application Japan, June 30, 1967, 42/41894
Int. Cl. C07c *47/18*
U.S. Cl. 260—211.5 R **3 Claims**

Polyoxins J, K and L are each a novel antibiotic to be used as an agricultural fungicide for the protection of plants.

Said polyoxins J, K and L are recovered from a culture obtained by cultivating in a culture medium *Streptomyces cacaoi* var. *asoensis* that is on deposit with the American Type Culture Collection (ATCC) as ATCC access numbers 19093 and 19094.

3,625,941

ALPHA-{2-LOWER ALKYL-2-[2-(6-ALKOXY OR TERTIARY AMINO-1,2,3,4-TETRAHYDROXAPHTH-1-YLIDEN)ETHYL]-3-OXOCYCLOPENT-1-YLIDENAMINOXY OR HYDRAZINO}ALKANOIC ACIDS AND ASYMMETRIC PROCESS FOR THEIR PRODUCTION

Raphael Pappo, Skokie, and Robert T. Nicholson, Glenview, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Apr. 30, 1968, Ser. No. 725,533
Int. Cl. C07d *87/42*
U.S. Cl. 260—247.2 R **11 Claims**

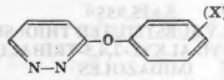
Process for the selective manufacture of novel steroid intermediates possessing either the *d* or l stereo-chemical configuration.

3,625,942
3A,12B-DIHYDRO-8H-DIBENZO[3,4,6,7] CYCLOHEPT[1,2-D]OXAZOL-8-ONES
Albrecht Edenhofer, Riehen, and Hans Spiegelberg, Basel, both of Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.
Filed Mar. 19, 1968, Ser. No. 714,320
Claims priority, application Switzerland, Mar. 23, 1967, 4246/67
Int. Cl. C07d *99/00*
U.S. Cl. 260—247.5 R 20 Claims

3a,12b-dihydro-8H-dibenzo[3,4,6,7]cyclohept[1,2,-d]oxazol-8-ones having at the 2-position an alkylated amino group and 2,3,3a,12b-tetrahydro-8H-dibenzo[3,4,6,7] cyclohept[1,2-d]oxazol-8-ones having at the 2-position an alkylated imino group are prepared, inter alia, by reacting a corresponding dibenzo-cyclohept-oxazole compound having at the 2-position an unsubstituted amino, an alkyl substituted mercapto, an unsubstituted imino or a thioxo group, with an appropriate amine. The compounds of the invention are useful, for example, as antidepressant agents.

3,625,943
3-PHENOXY-PYRRIDAZINES SUITABLE FOR HERBICIDAL COMPOSITION
Saburo Tamura, Tokyo; Tetsuo Takematsu, Utsunomiya; Kozo Oyamada, and Teruomi Jojima, both of Tokyo, all of Japan, assignors to Sankyo Company Limited, Tokyo, Japan
Original application Mar. 23, 1966, Ser. No. 536,613, now Patent No. 3,427,146. Divided and this application June 11, 1968, Ser. No. 736,015
Int. Cl. C07d *51/04*
U.S. Cl. 260—250 5 Claims

Compounds for the control of undesired plants and for retarding plant growth, which have the formula



wherein X is methyl or chlorine and *n* is an integer of 1 to 5 inclusive; provided that when *n* is an integer of 1 to 3 inclusive, X may be the same or different and, when *n* is an integer of 4 or 5, each X represents chlorine.
The invention relates also to some of the inorganic and trichloroacetic acid addition salts of the compounds.

3,625,944
METHOD FOR PREPARATION OF CHLORINATED METHYL PYRAZINES
Edward J. J. Grabowski, Iselin; Edward W. Tristram, Cranford, and Roger J. Tull, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.
Filed Oct. 10, 1968, Ser. No. 766,652
Int. Cl. C07d *51/76*
U.S. Cl. 260—250 4 Claims

The direction chlorination of methylpyrazine by heating in a solvent to provide chlorinated 2-methylpyrazine compounds is described. The compounds are useful as intermediates in preparing the therapeutically active (3-aminopyrazinoyl) guanidine products which are effective natriuretic and antikaluretic compounds.

3,625,945
METHOD OF PREPARING ACRIDINES AND INTERMEDIATES THEREFOR
Elvin L. Anderson, Moorestown, N.J., and Harold Graboyes, Philadelphia, Pa., assignors to Smith Kline & French Laboratories, Philadelphia, Pa.
Filed May 29, 1968, Ser. No. 732,869
Int. Cl. C07d *37/16, 37/14*
U.S. Cl. 260—279 R 8 Claims

Acridines are prepared by reacting a diphenylamine-2-carboxylic acid benzenesulfonylhydrazide with a base and hydrazine, semicarbazide, thiosemicarbazide or phenylhydrazine and reacting the resulting diphenylamine-2-carboxaldehyde derivative with a mineral acid. The acridines are useful as intermediates for preparing 9-aminoalkylacridans having pharmacodynamic activity.

3,625,946
1,4 ENDOMETHYLENE CYCLOHEXANE-2,3 ENDO-CIO DI CARBOXIMIDO GLUTARIMIDES
Heinrich P. Koch, and Johannes F. Kotlan, both of Vienna, Austria, assignors to F. Joh Kwizda, Vienna, Austria
Filed Nov. 2, 1967, Ser. No. 683,091
Claims priority, application Austria, Nov. 8, 1966, 10341/66
Int. Cl. C07d *31/32*
U.S. Cl. 260—281 3 Claims

Cyclic derivatives of succinic and glutaric acids are described, which are substituted by imide groups derived from specific cyclic dicarboxylic acids. The derivatives according to the invention are free of an aromatic phthalimide grouping and exhibit a tranquilizing activity on certain parts of the central nervous system, whereas they are free of embryotoxic (teratogenous) secondary effects when administered to pregnant mammals.

3,625,947
N HETEROCYCLIC ETHYL NAPHTHALIMIDES
Tamehiko Noguchi, Tokyo; Mitsukuni Sumitani, Soka-shi; Kenkichi Tsukamoto, Yono-shi, and Daisaku Matsunaga, Urawa-shi, all of Japan, assignors to Nippon Kayaku Kabushiko Kaisha, Tokyo, Japan
Filed Jan. 23, 1968, Ser. No. 699,802
Claims priority, application Japan, Jan. 30, 1957, 42/5573
Int. Cl. C07d *39/00*
U.S. Cl. 260—281 6 Claims

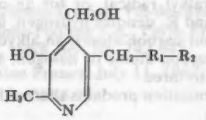
The present invention is directed to novel naphthalimide derivatives which have been quaternized or made into a salt form and a method for preparing the same. The present compound is used in fluorescent whitening of various synthetic fibers, particularly polyacrylonitrile fibers.

3,625,948
PROCESS FOR THE PREPARATION OF HEXAHYDROMETHANOBENZAZOCINES
Jorg Haberli, Warwick, R.I., assignor to Geigy Chemical Corporation, Ardsley, N.Y.
Filed June 21, 1968, Ser. No. 738,853
Int. Cl. C07d *39/00*
U.S. Cl. 260—294 A 4 Claims

3-carbamyl-1,2,3,4,5,6-hexahydro-2,6-methano-3-benzazocines are prepared from the corresponding 3-unsubstituted compounds by treatment with urea.

3,625,949
SULFUR-CONTAINING DERIVATIVES OF 2-METHYL-4-HYDROXYMETHYL-5-METHYLENE-PYRIDINE
Gustav Schorre, and Herbert Nowak, both of Darmstadt, Germany, assignors to E. Merck A. G., Darmstadt, Germany
Filed June 7, 1968, Ser. No. 735,182
Claims priority, application Germany, June 8, 1967, M 74311
Int. Cl. C07d *31/48, 31/50*
U.S. Cl. 260—294.8 8 Claims

For increasing the tolerance of animals to a deficiency of oxygen, compounds of the formula:



wherein R_1 represents —S— or

and R_2 represents lower acyl,

lower unsaturated

alkyl, unsubstituted alkyl and substituted alkyl; with the provision that when R_1 represents -S-, R_2 is other than ethyl β-chloroethyl or β-hydroxyethyl.

3,625,950

CERTAIN HALOPHENOXY ALKANAMIDES, HYDRAZIDES AND DERIVATIVES THEREOF

Edward J. Cragoe, Jr., and Norman P. Gould, both of Lansdale, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed July 3, 1968, Ser. No. 742,129

Int. Cl. C07d *31/44*

U.S. Cl. 260—295 H **5 Claims**

The invention relates to ω,ω-dimethyl-ω-(halophenoxy)-alkanamides, i.e., alkanamides bearing a halophenoxy and two methyl groups on the terminal carbon atom. The products are obtained by treating the corresponding ω,ω-dimethyl-ω-(halophenoxy)alkanoic acid ester or imidazole derivative thereof with an amine to form the desired amide. The said products are hypoglycemic agents, that is, they reduce the concentration of glucose in the blood.

3,625,951

PREPARATION OF 3,4-DISUBSTITUTED-DELTA-2-1,2,-TRIAZOLINE-5-THIONES

Tony Cebalo, Indianapolis, Ind., assignor to Air Products and Chemicals, Inc., Allentown, Pa.

Continuation-in-part of application Ser. No. 32,715, Apr. 28, 1970, which is a continuation-in-part of application Ser. No. 835,221, June 20, 1969. This application Dec. 23, 1970, Ser. No. 101,180

Int. Cl. C07d *55/06*

U.S. Cl. 260—308 A **9 Claims**

The invention relates to the method of synthesis of certain 3,4-disubstituted-Δ^2-1,2,4-triazoline-5-thiones by reacting the appropriate alkylthiosemicarbazide with certain fluoroalkylcarboxylic acids. The reaction in its preferred embodiment is carried out by azeotropic distillation of byproduct water.

3,625,952

7-TRIAZOLYL-3-PHENYL-COUMARINS

Carl-Wolfgang Schellhammer, Opladen, Germany, assignor to Farlenfabriken Bayer Aktiengeselischaft, Leverkusen, Germany

Filed Jan. 15, 1968, Ser. No. 697,605

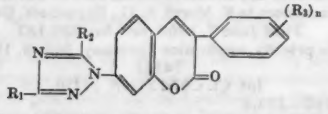
Claims priority, application Germany, Jan. 20, 1967, F 51 305

Int. Cl. C07d *99/04*

U.S. Cl. 260—308 R **5 Claims**

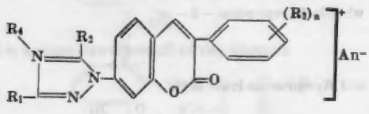
Fluorescent compounds adapted for use as optical brightening agents in fibers, foils, filaments, fabrics, and plastics are provided as follows:

7-[1,2,4-triazolyl-(1)]-3-phenyl -coumarin compounds of the general formula



in which R_1 and R_2, independently of one another, stand for hydrogen for an alkyl raidcal with one to four carbon atoms, for an aralkyl radical, or for an optionally substituted aryl radical, and R_3 denotes hydrogen, an alkyl radical containing one to four carbon atoms, an alkyoxy radical containing one to four carbon atoms or halogen, and n stands for the numbers one to three

or quaternisation products thereof having the formula



wherein R_1, R_3, R_3 and n have the meansings given above, R_4 stands for an alkyl radical with one to four carbon atoms or an aralkyl radical and An^- denotes a colorless anion.

3,625,953

ALIPHATIC OXAALKYL-2,4,5-TRIHALOGENO-IMIDAZOLES

Hans Rutz, Basel, and Kurt Gubler, Riehen, both of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Apr. 24, 1968, Ser. No. 723,903

Claims priority, application Switzerland, Apr. 26, 1967, 5960/67

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **6 Claims**

2,4,5-trihalogeno-imidazoles substituted in 1-position at the imidazole nucleus by a group of the formula R—O—A— wherein R represents an optionally substituted aliphatic hydrocarbon radical and A represents an alkylene group, are described, which imidazoles are herbicidally active and useful in the control of weeds and the like undesirable plant growth; herbicidal compositions containing such imidazoles as active ingredients, and method of controlling undesirable plant growth with the aid of such compounds are also disclosed.

3,625,954

1-AROYLBENZIMIDAZOLES

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc.

Filed Mar. 20, 1968, Ser. No. 714,416

Int. Cl. C07d *49/38*

U.S. Cl. 260—309.2 **2 Claims**

1-aroylbenzimidazoles and 1-aroylbenzotriazoles and their use as anti-inflammatory agents in the treatment of arthritic disorders.

3,625,955

ALIPHATICALLY SUBSTITUTED THIO- SULFINYL- AND SULFONYL-ALKYL-2,4,5-TRIHALOGENO-IMIDAZOLES

Hans Rutz, Basel, and Kurt Gubler, Riehen, both of Switzerland, assignors to Geigy Chemical Corporation, Ardsley, N.Y.

Filed Apr. 24, 1968, Ser. No. 723,904

Claims priority, application Switzerland, Apr. 26, 1967, 5960/67

Int. Cl. C07d *49/36*

U.S. Cl. 260—309 **6 Claims**

2,4,5-trihalogeno-imidazoles substituted in 1-position at the imidazole nucleus by a group of the formula R—S—A—, R—SO—A or R—SO_2—A—in which group R represents an optionally substituted aliphatic hydrocarbon radical and A represents an alkylene group, are described, which imidazoles are acaricidally active and at the same time well tolerated by cultivated plants; they are thus useful for the control of acarinae, and especially of spider mites, on cultivated plants and trees. Acaricidal compositions containing such novel imidazoles as active ingredients, and a method of controlling acarinae with the aid of such compounds are also disclosed.

3,625,956

1-PHENYL-4-ALKYL-2-IMIDAZOLONE DERIVATIVES

Enos C. Pesterfield, Jr., Briarcliff Manor, N.Y., assignor to Ciba-Geigy Corporation

Filed Dec. 8, 1967, Ser. No. 689,006

Int. Cl. C07d *49/34*

U.S. Cl. 260—309.6 **6 Claims**

2-Imidazolones having a phenyl or substituted phenyl group in the 1-position and a lower alkyl group in the 4-position, such as 1-phenyl-, 1-(4-trifluoromethyl-phenyl)-, 1-(4-methoxyphenyl)-, 1-(fluorophenyl)-, and 1-(4-chlorophenyl)-4-methyl-2-imidazolones, are anti-inflammatory agents having analgesic and antipyretic properties and can be prepared by acid catalyzed cyclization of the urea derived from a phenyl or substituted phenyl isocyanate and an acetal of an α-aminoalkylaldehyde.

3,625,957

4-ARYL (OR ALKYL) SULFONYL DERIVATIVES OF TETRAHYDRO-BENZODIAZEPINES

Rodney Ian Fryer, North Caldwell, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Continuation-in-part of application Ser. No. 614,009, Feb. 6, 1967, now abandoned. This application Jan. 25, 1968, Ser. No. 700,348

Int. Cl. C07d *53/06, 57/00*

U.S. Cl. 260—239 BD 5 Claims

Process for preparing dihydro-benzodiazepines from tetrahydro-benzodiazepines which involves forming novel 4-aryl or alkyl sulfonyl or alkanoyl derivatives of tetrahydro-benzodiazepines and with base, converting same to dihydro-benzodiazepines. Novel benzodiazepine-2-ones having an ethylenic linkage joining positions 3 and 4 are formed as intermediates.

Dihydro-benzodiazepines are useful as muscle relaxants, sedatives and anticonvulsants.

3,625,958

PROCESS FOR THE SYNTHESIS OF SUBSTITUTED 1,4-DIAZA-CYCLOHEPTENES

Giuseppe Cantatore, and Alberto Bonvicini, both of Terni, Italy, assignors to Montecatini Edison S.p.A.

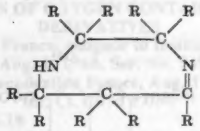
Filed Oct. 10, 1967, Ser. No. 674,115

Claims priority, application Italy, Oct. 14, 1966, 28857 A/66

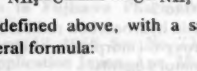
Int. Cl. C07d *53/02*

U.S. Cl. 260—239 BC 6 Claims

Process for the preparation of a substituted 1,4-diaza-cycloheptene of the general formula:



wherein R may be the same or different and is a hydrogen atom or an alkyl group having from about one to 12 carbon atoms. Involves reacting in the presence of an acid catalyst such as hydrochloric acid, nitric acid, acetic acid, formic acid, ammonium nitrate, p-toluene-sulphonic acid, aluminum chloride, ferric nitrate, or ethylenediamine dichlorohydrate, an ethylenediamine of the general formula:



wherein R is as defined above, with a saturated aliphatic ketone of the general formula:

R—CO—R

wherein R may be the same or different and is an alkyl group having one to 12 carbon atoms.

3,625,959

PREPARATION OF 2,3,4,5-TETRAHYDRO-5-PHENYL-1H-1, 4-BENZODIAZEPIN-4-OLS

George Francis Field, Nutley, and Leo Henryk Sternbach, Upper Montclair, both of N.J., assignors to Hoffman-La Roche Inc., Nutley, N.J.

Original application Dec. 3, 1964, Ser. No. 415,793, now Patent No. 3,398,139, which is a continuation-in-part of application Ser. No. 358,919, Apr. 10, 1964, now abandoned , which is a continuation-in-part of application Ser. No. 400,193, Sept. 29, 1964, now abandoned. Divided and this application Apr. 9, 1968, Ser. No. 735,480

Int. Cl. C07d *41/08*

U.S. Cl. 260—239 1 Claim

A method for preparing 2,3,4,5-tetrahydro-5-phenyl-1H-1,4-benzodiazepin-4-ols by reduction of phenyl quinazoline 3-oxides or 5-phenyl-1,4-benzodiazepine-4-oxo compounds.

3,625,960

RIFAMYCIN SV DERIVATIVES

Nicola Maggi, Milan, Italy, assignor to Lepetit S.p.A.-Gruppo per la Ricerca Scientifica e la Produzione Chimica Farmaceutica, Milan, Italy

Filed Oct. 16, 1967, Ser. No. 675,341

Claims priority, application Great Britain, Oct. 25, 1966, 47,899/66

Int. Cl. C07d *87/54*

U.S. Cl. 260—239.3 7 Claims

The application discloses new rifamycin SV derivatives in which a sulfur atom links the rifamycin nucleus to radicals of various nature. A process for the preparation of the new derivatives, which show a high degree of antibacterial activity, is also disclosed.

3,625,961

RIFAMYCINS

Nicola Maggi, Cusano Milan, Italy, assignor to Lepetit S.p.A. Gruppo per la Ricerca Scientifica e la Produzione Chimica Farmaceutica, Milan, Italy

Filed Feb. 5, 1968, Ser. No. 702,796

Claims priority, application Great Britain, Mar. 1, 1967, 9,755/67

Int. Cl. C07d *41/00*

U.S. Cl. 260—239.3 P 6 Claims

The invention is concerned with new pyrrolo-rifamycins, and a process for preparing the same starting from rifamycin S and an unsaturated amine carbonyl compound. The substances are highly active as antibacterials and are particularly fit for topical use, being generally of light yellow color.

3,625,962

BENZODIAZEPINE COMPOUND

Franco De Marchi, and Gianfranco Tamagnone, both of Turin, Italy, assignors to Stabilimenti Chimici Farmaceutici Riuniti Schiapparelli S.p.A., Turin, Italy

Filed May 7, 1968, Ser. No. 727,357

Claims priority, application Italy, May 15, 1967, 51724-A/67

Int. Cl. C07d *53/06*

U.S. Cl. 260—239.3 D 1 Claim

A therapeutically effective diazepine compound consisting of 7-chloro-1,3-dihydro-3-hemisuccinyloxy-5-phenyl-2H-1,4-benzodiazepine-2-one dimethylaminoethanol salt which compound is particularly effective for the treatment of anxiety in convulsive syndroms of any origin, even in the presence of depressive symptoms, and for eliminating tension and spasms of the skeletal muscular system.

3,625,963

PROCESS FOR THE PREPARATION OF 3-METHANESULPHONYL-PHENTHIAZINES

Francois Capitant, Paris; Guy Lalanne, Ris-Orangis, Essonne, and Albert Robin, Le Plessis-Trevise, Val-de-Marne, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed July 10, 1968, Ser. No. 743,645

Claims priority, application France, July 11, 1967, 113935

Int. Cl. C07d *93/14*

U.S. Cl. 260—243 A 15 Claims

3-Methanesulphonyl-phenthiazines (Beilstein nomenclature) unsubstituted or substituted on the nitrogen atom of the phenthiazine nucleus are prepared by oxidizing the methylthio group of a corresponding 3-methylthiophenthiazine to a methanesulphonyl group, such procedure simultaneously causing oxidation of the sulfur atom in the phenthiazine nucleus, and reducing by the action of hydrogen the resultant 3-methanesulphonyl-9-oxophenthiazine to a 3-methanesulphonyl-phenthiazine.

3,625,964

PRODUCTION OF METAL SALTS OF DIORGANO SUBSTITUTED ISOCYANURATES

Ferry A. Argabright, both of Littleton; Brian L. Phillips, Littleton, and Charles H. De Puy, Boulder, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Continuation-in-part of application Ser. No. 682,545, Nov. 13, 1967, now abandoned. This application Oct. 29, 1969, Ser. No. 872,380

Int. Cl. C07d 55/38

U.S. Cl. 260—248 NS 10 Claims

Substituted isocyanurates containing from two to three substituents per molecule are prepared from 1,3-diarylureteidiones by reacting 1,3-diaryluret-ediones with metal cyanates in a reaction mixture containing a dipolar aprotic solvent. Thereafter, this metal salt of a substituted isocyanurate may be reacted with a mineral acid in aqueous solution to form a disubstituted isocyanurate as a precipitate, or, may be reacted with an organic halide to form a trisubstituted isocyanurate.

The products of the invention are useful as intermediates in the production of pharmaceuticals, insecticides, disinfectants, and in the preparation of polymers.

3,625,965

1-CINNAMYL-4-LOWER ALKYLCARBONYL-OR 4-PHENYLCARBONYL PIPERIZINES

Tsutomu Irikura; Kuniyasu Masuzawa; Keigo Nishino; Hiroaki Uchida; Masatoshi Ito, all of Tokyo; Noriko Ichinoseki, Saitama, and Hideo Okubo, Tokyo, all of Japan, assignors to Kyorin Seiyaku Kabushiki Kaisha, Tokyo, Japan

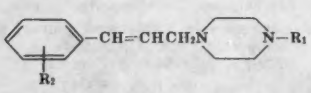
Filed Dec. 27, 1967, Ser. No. 693,786

Claims priority, application Japan, Dec. 28, 1966, SHO 42-665

Int. Cl. C07d 51/70

U.S. Cl. 260—240 K 10 Claims

Compounds of the formula



wherein R_1 is lower alkylcarbonyl or phenylcarbonyl (benzoyl) and R_2 is H or Cl are very useful analgesics, as well as antiphlogistics because of their antiserotonic action, and are nonaddictive.

3,625,966

BIOCIDAL TRIHYDROCARBYLTIN SALTS

Christian H. Stapfer, Newtown, Pa., assignor to Carlisle Chemical Works, Inc., Reading, Ohio

Filed Jan. 3, 1968, Ser. No. 695,342

Int. Cl. C07f 7/22

U.S. Cl. 260—242 2 Claims

Trihydrocarbyltin salts of oxobenzothiazine acetic acids are used as biocides.

3,625,967

DERIVATIVES OF 1,4-DIHYDRO-3H-2,3-BENZOXAZINE

David G. Martin, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Nov. 29, 1967, Ser. No. 686,733

Int. Cl. C07d 87/12

U.S. Cl. 260—244 R 6 Claims

1,6-Dihydro-4-phenyl-2,5,3-benzodioxazocine (1), 1,4-dihydro-3H-2,3-benzoxazine-3-carboxamide (1'*a*), N-alkyl-1,4-dihydro-3H-2,3-benzoxazine-3-carboxamides (1'*b*), 1,4-dihydro-3H-2,3-benzoxazine-3-carboxamidine (1'*c*) and its acid addition salts, process for the preparation thereof and novel intermediates prepared by said processes. Compounds 1, 1'*a*, and 1'*b* principally exhibit antilipemic activity. Compound 1'*c* is useful for preparing mothproofing agents and inhibitors that can be used in the acid pickling of steel.

3,625,968

PRODUCTION OF TETRAHYDRO-1,2,4-OXADIAZINE-3,5-DIONES

Albrecht Zschocke, Bad Duerkheim; Karl-Heinz Koenig, Ludwigshafen am Rhine, and Gustav Steinbrunn, Schwegenheim/Pfalz, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Jan. 8, 1968, Ser. No. 696,138

Claims priority, application Germany, Jan. 12, 1967, P 16 70 180.7

Int. Cl. C07d 87/52

U.S. Cl. 260—244 1 Claim

The production of substituted tetrahydro-1,2,4-oxadiazine-3,5-diones by the reaction of open-chain substituted N-(α-carboxy)-alkoxyureas with cyclizing agents in the form of chlorides or bromides of phosphoric acid, phosphorous acid, sulfurous acid or carbonic acid. The products of the process (some of which are new substances) are herbicides, diuretic and antiphlogistic pharmaceuticals and valuable starting products for the production of pesticides and pharmaceuticals.

3,625,969

6-SULFAMYL-4-HYDROXY-3-CARBOXY-QUINOLINES

Alberto Rossi, Oberwil, Switzerland, assignor to Ciba Corporation, New York, N.Y.

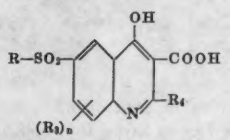
Filed Oct. 10, 1967, Ser. No. 674,129

Claims priority, application Switzerland, Oct. 20, 1966, 15318/66

Int. Cl. C07d 87/46

U.S. Cl. 260—247.1 9 Claims

Compounds of the formula



in which

R = disubstituted amino group

R_3 = lower aliphatic hydrocarbon radical, lower alkoxy group, lower alkenyloxy group, hydroxy group, halogen, trifluoromethyl

n = integer from 0 to 3

R_4 = lower aliphatic hydrocarbon radical for example: 3-carboxy-4-hydroxy-6-(morpholinosulfamyl)-quinoline.

Use: anti-inflammatory agents.

3,625,970

1-(DISUBSTITUTED PHENYL OR BENZYL)-1H-INDAZOL-3-YLOXYACETIC ACID

Laszlo Ambrus, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Apr. 17, 1968, Ser. No. 721,918

Int. Cl. C07d 49/02

U.S. Cl. 260—310 C 6 Claims

Chemical compounds in which the hydroxyl hydrogen atom of a 1-(disubstituted phenyl or benzyl)-1H-indazol-3-ol is replaced by a carboxymethyl moiety to yield 1-(disubstituted phenyl or benzyl)-1H-indazol-3-yloxyacetic acids are described.

The compounds can be prepared by forming the alkali metal salt of the indazol-3-ol and effecting a Williamson Ether Synthesis reaction with a carboxymethyl halide.

The compounds possess anti-inflammatory activity as demonstrated by the Limb Volume Test procedure.

3,625,971

LOWER ALKYLESTERS OF 1-(DISUBSTITUTED PHENYL OR BENZYL)-1H-INDAZOL-3-YLOXY ACETIC ACIDS

Laszlo Ambrus, Oakland, Calif., assignor to Cutter Laboratories, Inc., Berkeley, Calif.

Filed Apr. 17, 1968, Ser. No. 721,937
Int. Cl. C07d 49/02
U.S. Cl. 260—310 C 9 Claims

Chemical compounds in which the hydroxyl hydrogen atom of a 1-(disubstituted phenyl or benzyl)-1H-indazol-3-ol is replaced by a carb-lower alkoxymethyl group yielding the corresponding lower alkyl esters of 1-(disubstituted phenyl or benzyl)-1H-indazol-3-yloxy acetic acid are described.
The compounds can be prepared by forming the sodium salt of the indazol-3-ol by effecting a Williamson Ether Synthesis reaction with carb-lower alkoxymethyl halide.
The compounds possess anti-inflammatory activity as demonstrated by the Limb Volume Test procedure.

3,625,972

N-PHENYLBENZANILIDES

John W. Schulenberg, Bethlehem, N.Y., assignor to Sterling Drug Inc., New York, N.Y.

Filed July 3, 1968, Ser. No. 742,161
U.S. Cl. 260—326.3 9 Claims

N-Arylanilines, further substituted on nitrogen by aroyl, aralkanoyl or aralkyl groups, and wherein one of the aryl groups has a 3— or 4—(aminoalkoxy)substituent, having hypocholesteremic activity, are prepared by a series of O-alkylation, N-acylation or -alkylation, and reduction reactions starting from the appropriate hydroxydiarylamines or benzyl ethers thereof.

3,625,973

PREPARATION OF OXYGEN CONTAINING INDOLE DERIVATIVES

Marc Julia, Paris, France, assignor to Institut Pasteur

Filed Aug. 1, 1968, Ser. No. 749,295
Claims priority, application France, Aug. 17, 1967, 118053
Int. Cl. C07d 27/56
U.S. Cl. 260—326.16 9 Claims

Method of preparing indole derivatives bearing an oxygen containing group the oxygen of which is linked with one of the carbon atoms in positions 4 and 7, which comprises cyclizing in acid medium a 4-(2'-pyrrolyl)-butyric acid or its direct derivative having optionally substitutions in its aliphatic chain or/and in its pyrrolic nucleus.

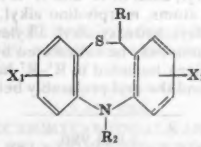
3,625,974

DIBENZOTHIAZEPINE DERIVATIVES

Suminori Umio, Kawani-shi, and Ikuo Ueda, Sakai, both of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Filed Apr. 18, 1968, Ser. No. 722,169
Claims priority, application Japan, Apr. 28, 1967, 42/27625
Int. Cl. A61k 27/00; C07d 93/42
U.S. Cl. 260—327 9 Claims

Compounds of the formula



wherein each of X_1 and X_2 is hydrogen or halogen; R_1 is alkyl, haloalkyl, aralkyl or alkyl substituted with R_3 in which R_3 is amino, alkylamino, dialkylamino; and R_2 is hydrogen, alkyl, haloalkyl, aralkyl or alkyl substituted with R_3 in which R_3 is the same meaning as defined above, provided that either R_1 or R_2 should be alkyl substituted with R_3. These compounds possess potent antireserpinelike activity which makes them useful as an antidepressant.

3,625,975

LACTONES BY OXIDATION PROCESS

Clifford A. Crampton, Harpenden; Charles F. Cardy, Luton; Keith G. Sampson, Clophill, and Ian R. King, London, all of England, assignors to Laporte Chemicals Limited

Filed Sept. 28, 1967, Ser. No. 671,201
Claims priority, application Great Britain, Sept. 30, 1966, 43,880/66
Int. Cl. C07d 7/06, 7/00
U.S. Cl. 260—343 22 Claims

Lactones are prepared by a reaction between a peroxycarboxylic acid having one to eight carbon atoms and a cyclic monoketone having five to 12 carbon atoms in a ring and zero to three methyl groups as substituents by means of a novel process involving forming a vapor mixture containing said peroxy carboxylic acid, condensing said vapor mixture to the liquid state and reacting the condensed liquid with said cyclic monoketone.

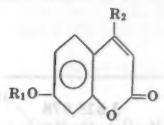
3,625,976

COUMARIN ETHER SUN-SCREENING COMPOUNDS

Ernst Theodore Theimer, Rumson, N.J., assignor to International Flavors & Fragrances, Inc., New York, N.Y.

Filed Dec. 9, 1969, Ser. No. 883,239
Int. Cl. C07d 7/26
U.S. Cl. 260—343.2 R 3 Claims

The use as sun-screening agents of essentially colorless, stable, odorless, nonirritating, nonsensitizing, and oil-compatible coumarin ether compounds, such compounds having the formula:



wherein R_1 is alkenyl, cycloalkenyl, alkadienyl, cycloalkadienyl, alkatrienyl, alkoxyalkadienyl, acyloxyalkadienyl, alkoxyalkenyl, cyclialkoxyalkenyl, aryl, alkaryl, or aralkyl and R_2 is hydrogen or lower alkyl and such compounds having ultraviolet absorption maxima within the range of 2,900 A. up to about 3,400 A. The compounds wherein R_2 is lower alkyl and R_1 is alkadienyl or where R_1 is cycloalkadienyl or cycloalkenyl are novel compounds.

3,625,977

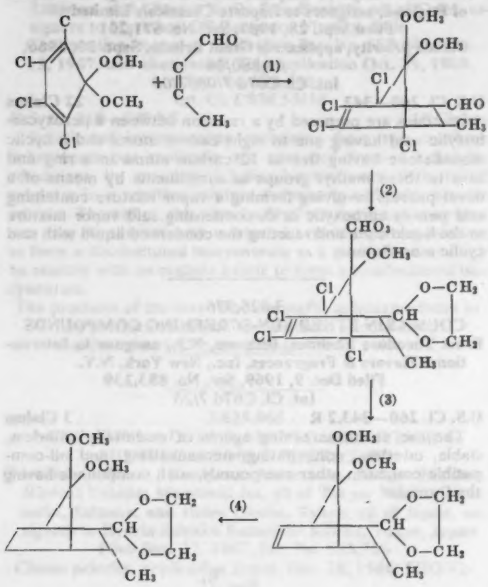
2-ACETAL-7-KETAL-5-NORBORNENE AND 2-ACETAL-7-KETALNORBORNANE COMPOUNDS

Fredrick Lynn Hamb, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 4, 1968, Ser. No. 765,036
Int. Cl. C07d 13/02, 15/04
U.S. Cl. 260—340.7 15 Claims

2-Acetal-7-ketal-5-norbornene compounds, such as 2-(1,3-dioxolan-2-yl)-3-methyl-7,7-dimethoxy-5-norbornene, and the corresponding norbornane compounds, for example, 2-(1,3-dioxolan-2-yl)-3-methyl-7,7-dimethoxynorbornane, are central nervous system depressants; and in addition, the norbornene compounds exhibit anticonvulsant activity. These compounds are synthesized from 1,2,3,4-tetrachloro-5-ketalcyclopentadienes and α,B-unsaturated aldehydes in a plural step synthesis comprising (1) a Diels-Alder addition, (2) acetalization, (3) dechlorination and, in the case of the nor-

bornane compounds, (4) hydrogenation, as is illustrated by the following equations:



3,625,978

HYDROXYARYLTHIO ANHYDRIDES AND ANALOGUES AND DERIVATIVES THEREOF

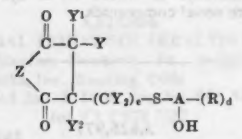
Emil J. Geering, Grand Island, and Norman W. Dachs, Buffalo, both of N.Y., assignors to Hooker Chemical Corporation, Niagara Falls, N.Y.

Filed Aug. 5, 1968, Ser. No. 749,952

Int. Cl. C07c *57/14*

U.S. Cl. 260—347.2 **14 Claims**

Novel compounds of the formula:



wherein *e* is from zero to one and *d* is from zero to about six, provided that when *e* is zero, Y^1 is hydrogen; and that when *e* is one, Y^2 is hydrogen; Y, Y^1 and Y^2 are of zero to about 20 carbon atoms and are independently selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, hydrogen, cyano, and halogen; Z is selected from the group consisting of —NH—, —O—, —S— and —CH CH—; A is aryl of six to 18 carbon atoms; and R is of zero to about 20 carbon atoms and is selected from the group consisting of alkyl, aryl, alkaryl, aralkyl, carbalkoxy, carbaryloxy, alkoxy, aryloxy, alkylthio, arylthio, hydroxy, mercapto, cyano, carboxy and halogen. Said compounds have utility as polymer additives. Novel polyester derivatives of the hydroxyarylthio succinic anhydride and thioanhydride compounds and a process for preparing said polyesters.

3,625,979

NOVEL BIOLOGICALLY ACTIVE SUBSTITUTED-S-TRIAZINES

Werner Heimberger, Hanau am Main, Germany, assignor to Deutsche Gold-und Silber-Scheidean-Stalt vormals Roessler, Frankfurt am Main, Germany

Filed Nov. 24, 1967, Ser. No. 685,258

Claims priority, application Germany, Nov. 24, 1966, D 51628The portion of the term of the patent subsequent to May 25, 1988, has been disclaimed.

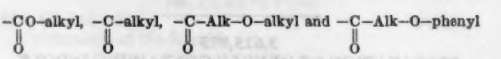
Int. Cl. C07d *55/22*

U.S. Cl. 260—247.5 R **5 Claims**

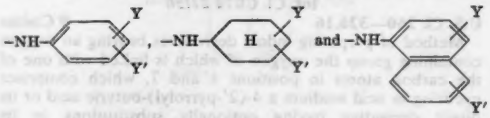
Novel biologically active substituted-s-triazines having anti-inflammatory action of the formula

I

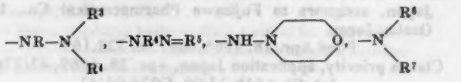
as well as their pharmologically acceptable acid addition salts with organic and inorganic acids wherein X is an N-cycloalkyldi-imine radical, preferably, a piperazine or homopiperazine radical or their N'-alkyl, N'-alkylol or N'-acyl substitution products in which the alkyl or alkylol groups contain one to six carbon atoms and the acyl radicals are



wherein the Alk is alkylene and the alkyl and alkylene have up to six carbon atoms R^1 is one of the radicals



wherein each Y and Y' is hydrogen, halogen, $—NO_2$, —alkyl, —O—alkyl, —OH or COOH, wherein the alkyl has up to six carbon atoms and R^2 is



piperazino, homopiperazino, piperidino or pyrrolidino, wherein each of R, R^3 and R^4 is hydrogen or an alkyl group of one to six carbon atoms or an aryl group, R^5 is lower alkyl, cycloalkyl, alkyl aryl, each of R^6 and R^7 is hydrogen, alkyl of one to six carbon atoms, morpholino alkyl, piperazino alkyl, homopiperazino alkyl, hydroxy alkyl, alkylene diamine whose second nitrogen atom may be substituted by alkyl or phenyl, the alkyl and alkylene included in R^1–R^7 having from one to six carbon atoms and the aryl preferably being phenyl.

3,625,980

HALOGENATED ANILINO COUMARIN COMPOUNDS

Gerald L. Bachman, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Jan. 2, 1968, Ser. No. 694,790

Int. Cl. C07d *7/28*

U.S. Cl. 260—343.2 R **10 Claims**

This disclosure covers certain halogenated anilino coumarins as new chemical compounds. These compounds have been found to be useful in the control of bacteria and fungi.

3,625,981

PROCESS FOR PREPARING GLYCIDOL

John Kollar, Wyckoff, N.J., assignor to Halcon International, Inc.

Continuation-in-part of application Ser. No. 419,568, Dec. 18, 1964, now abandoned. This application Apr. 18, 1968, Ser. No. 722,150

Int. Cl. C07d 1/18

U.S. Cl. 260—348.5 L 9 Claims

This invention relates to a process for preparing glycidol, by epoxidation of allyl alcohol with an organic hydroperoxide in the presence of an inorganic vanadium compound. Glycidol can be readily hydrolyzed to produce glycerine an important chemical of commerce.

3,625,982

(1,2-EPOXYPROPYL)PHOSPHONOUS ACID DERIVATIVES

Burton G. Christensen, Scotch Plains N.J., and William J. Leanza, Staten Island, N.Y., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 15, 1968, Ser. No. 729,388

Int. Cl. C07f 9/48

U.S. Cl. 260—348 R 6 Claims

(±) And (−)(cis-1,2-epoxypropyl)phosphonic acids are prepared by oxidation of (cis-1,2-epoxypropyl)phosphonous acid.

3,625,983

OXIDATION OF 2,4,6-TRI-TERT-ALKYLPHENOLS WITH AN ALKALI METAL HYDROXIDE CATALYST

John C. Wollensak, Bloomfield Hills, Mich., assignor to Ethyl Corporation, New York, N.Y.

Filed May 14, 1970, Ser. No. 037,348

Int. Cl. C07c 49/64

U.S. Cl. 260—396 R 7 Claims

Oxidation of 2,4,6-tri-tert-alkylphenols using an alkali metal hydroxide catalyst such as potassium hydroxide yields 2,6-di-tert-alkyl-p-benzoquinone. The reaction is promoted by the addition of water and a small amount of a copper halide such as cuprous chloride. The products are readily converted to p-hydroquinones by reduction. These are antioxidants and can be used as chemical intermediates.

3,625,984

CYCLOHEXA-1,4-DIENE-1-ACETIC ACIDS

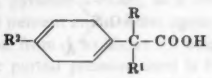
Seymour David Levine, North Brunswick; Patrick Andrew Diassi, Westfield, and Frank Lee Weisenborn, Somerset, all of N.J., assignors to E. R. Squibb & Sons, Inc., New York, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,640

Int. Cl. C07c 1/22

U.S. Cl. 260—396 N 2 Claims

This invention relates to new cyclohexa-1,4-diene-1-acetic acids of the formula



wherein R, R^1 and R^2 each is hydrogen or lower alkyl, and salts of these acids with bases, which are useful as anti-inflammatory agents.

3,625,985

ADAMANTANECARBOXAMIDOALKANOIC ACIDS AND RELATED COMPOUNDS

Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of application Ser. No. 467,749, June 28, 1965, now abandoned. This application May 8, 1968, Ser. No. 727,698

Int. Cl. C07c 13/52

U.S. Cl. 260—404 5 Claims

The present adamantanecarboxylic acid derivatives of amino acids possess antibiotic activity against a variety of organisms. Thus, they are antibacterial, antiprotozoal, and antialgal agents. The compounds are prepared by the reaction of an adamantanecarbonyl halide, preferably the chloride, with an appropriate amino acid, dipeptide, or polypeptide.

3,625,986

BIS 1, 1 ISOCYANATOALKYL CYCLOALKANES

Julian Feldman, and Robert J. Shaw, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Dec. 28, 1967, Ser. No. 694,114

Int. Cl. C07c 119/04; C08g 22/24, 22/44

U.S. Cl. 260—453 A 5 Claims

Alkyl diisocyanates such as 1-(isocyanatomethyl)-1-(3-isocyanatopropyl) cyclohexane; 1-(isocyanatomethyl)-1-(3-isocyanatoethyl) cyclohexane; bicyclo-[2.2.1]-2-isocyanatoethyl-2-(3-isocyanatopropyl)-heptane; bicyclo [4.3.0]-2-isocyanatomethyl-2-(3-isocyanatopropyl)-nonane and polyurethanes prepared therefrom. The diisocyanates are prepared by reacting the corresponding diamines with phosgene.

3,625,987

CYANO CARBAMOYLOXIMES

Adolf Hubele, Riehen, Switzerland, assignor to Ciba Limited, Basel, Switzerland

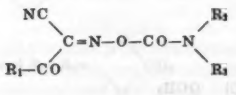
Filed Nov. 7, 1967, Ser. No. 681,101

Claims priority, application Switzerland, Nov. 10, 1966, 16259/66

Int. Cl. C07c 121/40, 121/46, 121/60

U.S. Cl. 260—465 D 11 Claims

The present invention relates to carbamates of the general formula



in which R_1 represents an alkoxy, aralkoxy, cycloalkoxy, aryloxy, alkylthio, aralkylthio, cycloalkylthio or arylthio radical, or in which R_1 represents a secondary or tertiary amido group, R_2 represents a hydrogen atom or a lower aliphatic radical and R_3 represents a hydrogen atom, a lower aliphatic radical or an unsubstituted or substituted aryl radical.

These compounds can be prepared by reaction of a cyanacetic acid ester or cyanacetic acid amide with an agent yielding nitrous acid and further reaction of the resulting oxime with either an isocyanate or a carbamic acid halide. The resulting carbamates are advantageously used as active substances for combating various kinds of pests, especially in preparaions for combating bacteria and fungi affecting animals and plants. Those separations may comprise, if desired, other known additives and pesticides.

3,625,988

REACTION PRODUCT OF CERTAIN ACID AND ALKANOLAMINE

Henryk A. Cyba, Evanston, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 329,979, Dec. 12, 1963, now abandoned. This application Apr. 10, 1968, Ser. No. 720,339

Int. Cl. C07c 97/06

U.S. Cl. 260—468 B 17 Claims

Reaction product formed by the condensation of certain alkanolamines with polyhalopolyhydropolycyclicdicarboxylic acids of the formula hereinafter given, its corresponding anhydride, corresponding diol or ester. These compounds have utility as stabilizers against deterioration of organic substances, such as lubricants, hydrocarbon oils and plastics, as well as possessing insecticidal properties.

3,625,989

PROCESS FOR PREPARING METHYL ANTHRANILATES

Ellis K. Fields, Chicago, Ill., assignor to Standard Oil Company, Chicago, Ill.

Filed Aug. 25, 1967, Ser. No. 663,245
Int. Cl. C07c *101/54*
U.S. Cl. 260—471 R 9 Claims

This invention relates to the intramolecular oxidation and reduction of aromatic hydrocarbons containing at least one methyl group and a nitro group ortho to the methyl group. Further, it relates to preparing methyl o-amino arylcarboxylates and aromatic amines. The process comprises reacting aromatic hydrocarbons having at least one methyl group and a nitro group ortho to the methyl group in a solvent at a temperature of about 450° to 750° C. When the solvent is methanol, methyl o-amino arylcarboxylates useful in anesthetics, printing inks for polyethylene, and useful in the manufacture of azo dyes are produced. Novel substituted methyl anthranilates have been produced which have the foregoing uses. When the solvent is benzene, cyclohexane or toluene, aromatic amines are produced. The aromatic amines are useful as pesticides, antioxidants and as pickling inhibitors for aluminum and zinc and as curing agent for epoxy resins.

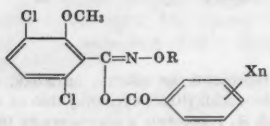
3,625,990

O-ACYLBENZOHYDORXAMATES

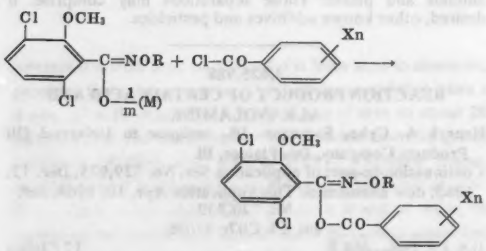
Teruhisa Noguchi, Fujisawa-shi; Mitsuo Asada, Naka-gun; Reiji Sakimoto, Takaoka-shi; Yoshiyasu Aoki, Kaminikawa-gun, and Mikio Sawaki, Takaoka-shi, all of Japan, assignors to Nippon Soda Katushiki Kaisha, Tokyo-to, Japan

Filed Apr. 24, 1968, Ser. No. 723,652
Claimspriority, application Japan, May 2, 1967, 42/27706
Int. Cl. C07c *93/00*
U.S. Cl. 260—471 R 9 Claims

The compound having formula;



wherein, R represents alkyl having one to six carbon atoms and X represents hydrogen, halogen, alkyl having one to three carbon atoms or alkoxy having one to three carbon atoms and n is an integer of 0–5 prepared in accordance with the following equation:



wherein M represents hydrogen or metal atom and m represents valency of M and R, X and n, each have the aforesaid meanings. The novel compounds have superior acaricidal activities without mammalian toxicity.

3,625,991

BENZOYLOXYETHYL-AMINO PROPANE COMPOUNDS

Laszlo Beregi, Boulogne; Pierre Hugon, Rueil-Malmaison, and Jean-Claude Le Douarec, Suresnes, all of France, assignors to Societe en nom collectif Science Union Et Cie, Societe Francaise De Recherche Medicale, Suresnes, France

Filed Apr. 30, 1968, Ser. No. 725,484
Claims priority, application Great Britain, May 12, 1967, 22,249/67
Int. Cl. C07c *95/08*
U.S. Cl. 260—477 7 Claims

1-phenyl-2-(β-benzoyloxyethyl-amino) propane, mono- or disubstituted on the phenyl radical by chlorine, bromine, fluorine, lower-alkyl or lower-alkoxy having up to four carbon atoms inclusive, in the form of racemic compounds and optical isomers, and acid addition salts thereof.
These compounds possess anorexigenic and lipid metabolism regulating properties.

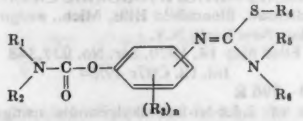
3,625,992

N-METHYL PHENYL CARBAMATES

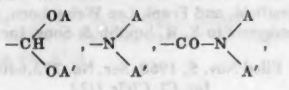
Dieter Duerr, Bottmingen, and Ladislaus Pinter, Basel, both of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Nov. 28, 1967, Ser. No. 686,342
Claims priority, application Switzerland, Dec. 1, 1966, 17181/66
Int. Cl. C07c *157/14*
U.S. Cl. 260—479 2 Claims

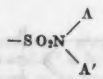
The present invention relates to carbamates of the general formula



in which R_1 is a substituent selected from the group consisting of hydrogen and an aliphatic radical, R_2 represents a substituent selected from the group consisting of an aliphatic, an araliphatic and an aromatic radical, R_3 is a substituent selected from the class consisting of a halogen atom, a lower alkyl, a lower alkoxy, a lower alkylthio, a lower alkylsulfinyl, a lower alkylsulfonyl radical, the group $-NO_2$, $-CN$, $-SCN$, $-CHO$,



and the group



(in which A and A′ are identical or different and each represents a hydrogen atom or a lower alkyl radical and/or a carbalkoxy group), *n* represents an integer selected from 0, 1 and 2, R_4 represents a substituent selected from the class consisting of a hydrogen atom, an aliphatic and an araliphatic radical, R_5 represents a substituent selected from the class consisting of a hydrogen atom, an aliphatic and an aromatic radical, R_6 represents a substituent selected from the class consisting of a hydrogen atom, an aliphatic radical, an aliphatic radical linked with the nitrogen atom through oxygen, with the proviso that when R_4 represents a hydrogen atom, the phenolic group must be in *p*-position relatively to the nitrogen-containing group as well as to pesticidal preparations containing, as active ingredients, such carbamates as defined above.

3,625,993

PROCESS FOR PRODUCING CARBAMATES

Hans Peter Horn, Orinda, Calif., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of application Ser. No. 674,758, Oct. 12, 1967, now abandoned. This application Apr. 22, 1968, Ser. No. 723,286
Int. Cl. C07c *125/06*
U.S. Cl. 260—479 C 16 Claims

Carbamates are produced by reacting alkyl amines with phosgene, directly admixing the resultant reaction mixture containing N-alkyl-carbamoyl chloride and alkyl isocyanate with an active hydrogen containing compound selected from the group consisting of aliphatic alcohols and thioalcohols, phenols and thiophenols, alicyclic alcohols and thioalcohols. The produced carbamate is recovered from this mixture in high-yield and purity.

3,625,994

PROCESS FOR MAKING POLYESTERS CONTAINING ETHER GROUPS

Herbert Eck, and Hellmuth Spes, both of Burghausen, Upper Bavaria, Germany, assignors to Wacker-Chemie G.m.b.H., Bavaria, Germany

Filed July 19, 1967, Ser. No. 654,354
Claims priority, application Germany, July 22, 1966, W 42065
Int. Cl. C07c *69/66*
U.S. Cl. 260—484 R 5 Claims

This invention relates to the manufacture of polyesters containing ether groups, and it has for its object to provide a novel and improved process for this purpose.

3,625,995

PRODUCTION OF ESTERS OF METHACRYLIC ACID

Donald N. Brattesani, La Habra, Calif., assignor to Union Oil Company, Los Angeles, Calif.

Filed May 1, 1968, Ser. No. 725,941
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 AC 11 Claims

Esters of methacrylic acid or acrylic acid are produced by the oxidative carbonylation of propylene or ethylene by contacting the olefin, oxygen and carbon monoxide in the presence of an alcohol, a Group VIII noble metal catalyst and, as a cocatalyst, an alkyl, cycloalkyl, aromatic or heterocyclic compound containing an oxide of nitrogen preferably in an aromatic or heterocyclic ring. The oxidation can also be performed in the presence of a redox agent. In a typical embodiment the olefin, carbon monoxide and oxygen are contacted with an alcoholic solution of Group VIII noble metal at a concentration from 0.001 to 1.0 molar, a nitrogen oxide compound, pyridine 1-oxide, at a concentration from 0.01 to 25 weight percent and a redox agent, cupric chloride, at a concentration from 1 to about 35 weight percent. The carbon monoxide partial pressure used is from 10 to about 70 percent of the total pressure which is from 300 to 3,000 p.s.i.g. Under these conditions a substantial portion of the product comprises the desired ester of methacrylic acid.

3,625,996

PREPARATION OF OLEFINIC ACIDS AND ESTERS

Donald M. Fenton, Anaheim, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Filed July 19, 1968, Ser. No. 745,991
Int. Cl. C07c *69/54*
U.S. Cl. 260—486 R 13 Claims

A process for preparation of olefinic acids or esters from dicarboxylic acids or esters comprising contacting the dicarboxylic acid or ester with a complex catalyst comprising a Group VIII noble metal and a ligand from the group consisting of organic phosphines, arsines and stibines. The olefinic acids and esters are useful as monomers in preparation of a wide variety of polymeric or copolymeric resins.

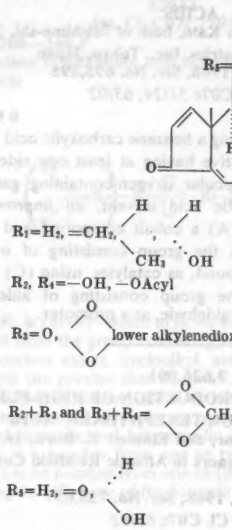
3,625,997

3-OXO-A-NOR-B-HOMO-PREGNADIENES AND A PROCESS FOR THEIR MANUFACTURE

Georg Anner, Basel; Hellmut Ueberwasser, Riehen, and Peter Wieland, Oberwil, Basel-Land, all of Switzerland, assignors to Ciba Corporation, New York, N.Y.

Filed Apr. 29, 1968, Ser. No. 725,182
Claims priority, application Switzerland, May 3, 1967, May 3, 1967; 6440/67, 6441/67
Int. Cl. C07c *69/02*
U.S. Cl. 260—488 14 Claims

Compounds of the formula



for example: 3,20-dioxo-11β,17-dihydroxy-21-acetoxy-A-nor-B-homo-pregna-1,5-diene or 3,11,20-trioxo-17-hydroxy-21-acetoxy-A-nor-B-homo-pregna-1,5,7-triene.
Use: anti-inflammatory agents.

3,625,998

PROCESS FOR THE MANUFACTURE OF VINYL ESTERS OF CARBOXYLIC ACIDS

Hans Fernholz, Fischbach, Taunus; Hans-Hoachim Schmidt, Frankfurt am Main, and Friedrich Wunder, Florsheim am Main, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Feb. 27, 1968, Ser. No. 708,509
Claims priority, application Germany, Aug. 10, 1967, F 53201
Int. Cl. C07c *67/04*
U.S. Cl. 260—497 A 14 Claims

Preparation of vinyl esters of carboxylic acids in the gaseous phase by reacting ethylene, oxygen and carboxylic acids at elevated temperatures in the presence of a catalyst consisting of a salt of a noble metal of the eighth group of the periodic system and 0.01 to 200 g. cadmium in the form of a cadmium salt of a carboxylic acid, this catalyst being supported on a carrier.

3,625,999

PROCESS FOR THE PREPARATION OF PHOSPHONIUM SULFONATE SALTS

Hill M. Priestley, North Bergen, N.J., assignor to Lever Brothers Company, New York, N.Y.

Filed Feb. 19, 1968, Ser. No. 706,698
Int. Cl. C07c *143/24*
U.S. Cl. 260—505 R 8 Claims

A process for the preparation of a phosphonium sulfonate salt or phosphobetaine which comprises mixing in an aqueous medium at a temperature from above 0° C. to below 100° C. an inorganic sulfite with a cyclic or noncyclic ethylenically unsaturated quarternary phosphonium halide at a mole ratio of at least 3:1.

3,626,000

PROCESS FOR PREPARING BENZENE CARBOXYLIC ACIDS

Kazuo Tsunoi, and Tadao Kato, both of Mishima-shi, Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Jan. 5, 1968, Ser. No. 695,895
Int. Cl. C07c *51/24*, *63/02*
U.S. Cl. 260—524 R 6 Claims

In a process for preparing a benzene carboxylic acid by oxidizing a benzene derivative having at least one side-chain alkyl group with a molecular oxygen-containing gas in a lower aliphatic carboxylic acid solvent, an improvement which comprises using (A) a cobalt compound and (B) a substance selected from the group consisting of metallic silver and a silver compound, as catalysts, using (C) a substance selected from the group consisting of aldehydes, ketones, alcohols and paraldehyde, as a promoter.

3,626,001

METHOD FOR THE PRODUCTION OF HIGH-PURITY ISOPHTHALIC OR TEREPHTHALIC ACID

Willis C. Keith, Flossmoor, and Emmett H. Burk, Jr., Glenwood, both of Ill., assignors to Atlantic Richfield Company, New York, N.Y.

Filed May 9, 1968, Ser. No. 728,037
Int. Cl. C07c *63/02*
U.S. Cl. 260—574 R 23 Claims

A method for the production of high purity isophthalic or terephthalic acid from a C_8 aromatic hydrocarbon feed stock containing a major amount of the desired isomer of xylene corresponding to the desired acid. The method comprises the two-stage oxidation of the isomer of xylene while limiting the amount of orthophathalic acid and water present in the oxidation feed. The feed contains the desired xylene isomer in an alkanoic acid solvent and contains a cobalt catalyst. An alkanal is added to the second stage of the oxidation method and the amount of alkanal added is adjusted with respect to the oxygen partial pressure. An oxidation product representing at least 75 percent conversion of xylene to the corresponding acid is obtained.

3,626,002

β-CARBOXYACRYLAMIDINE

Edward G. Daniels, Portage; Le Roy E. Johnson, Kalamazoo Township, Kalamazoo County; Floyd P. Kupiecki, Portage, and Paul F. Wiley, Texas Township, Kalamazoo County, all of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Filed Aug. 31, 1965, Ser. No. 484,086
Int. Cl. C07c *123/00*
U.S. Cl. 260—534 R 12 Claims

New compounds *cis*-β-carboxyacryl-amidine and *trans*-β-carboxyacrylamidine and processes for preparing the same. These compounds can be used as antifungal agents against *Blastomyces dermatitides* and *Coccidioides immitis*.

3,626,003

THIOCORNINE AND THIAMAMIDINE PHOSPHORIC CYSTEINE

Kiyoshi Kominato, and Yutaka Kominato, both of No. 15, Hagigakakiuchicho, Shimokamo, Sakyo-ku, Kyoto-shi, Japan

Filed Nov. 4, 1968, Ser. No. 773,294
Claims priority, application Japan, Nov. 8, 1967, 42/71834
Int. Cl. C07d *91/32*
U.S. Cl. 260—534 4 Claims

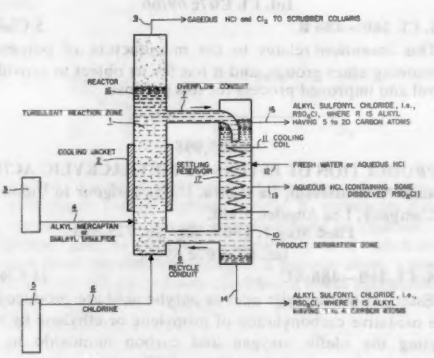
Thiocornine, an amino acid, and thiamamidine phosphoric cysteine are obtained from vegetable sources, e.g. Allium plants, or animal sources. The compounds are therapeutically useful.

3,626,004

METHOD OF PREPARING ALKYL SULFONYL CHLORIDE

Roland Maurice Guertin, Rockwood, Mich., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Dec. 7, 1967, Ser. No. 688,915
Int. Cl. C07c *143/70*
U.S. Cl. 260—543 R 10 Claims


GASEOUS HCl and Cl2 TO SCRUBBER COLUMNS
REACTOR
OVERFLOW CONDUIT
TURBULENT REACTION ZONE
ALKYL SULFONYL CHLORIDE, i.e., RSO2Cl, WHERE R IS ALKYL HAVING 5 to 20 CARBON ATOMS
COOLING COIL
COOLING JACKET
SETTLING RESERVOIR
FRESH WATER or AQUEOUS HCl
AQUEOUS HCl CONTAINING SOME DISSOLVED RSO2Cl
ALKYL MERCAPTAN DIALKYL DISULFIDE
PRODUCT SEPARATION ZONE
RECYCLE CONDUIT
CHLORINE
ALKYL SULFONYL CHLORIDE, i.e., RSO2Cl, WHERE R IS ALKYL HAVING 1 to 4 CARBON ATOMS

An alkyl sulfonyl chloride is prepared continuously in high yield by reacting an alkyl mercaptan or dialkyl disulfide having one to 20 carbon atoms in the alkyl group with chlorine in a medium comprising aqueous concentrated HCl solution, in a reaction zone free of mechanical agitation means, at such feed rates that the reaction creates a turbulent condition in the reaction zone, and passing the medium into a contiguous product separation zone wherein the alkyl sulfonyl chloride is separated and withdrawn from the aqueous medium.

3,626,005

PREPARATION OF UNSATURATED ACYL HALIDES

John A. Scheben, Erlanger, Ky.; Joseph M. Fisher, and Irving L. Mador, both of Cincinnati, Ohio, assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed July 14, 1967, Ser. No. 653,349
Int. Cl. C07c *51/58*
U.S. Cl. 260—544 A 10 Claims

A process for the preparation of unsaturated acyl halides by carbonylating vinylic halides in the presence of a Group VIII noble metal catalyst. Acryloyl chloride, for example, is formed by reacting vinyl chloride with carbon monoxide in the presence of a palladium metal catalyst at a temperature of from about 25° to 300° C., and a pressure from about 5 to 500 atmospheres.

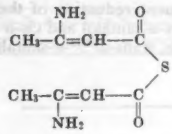
3,626,006

THIOLANHYDRIDE OF 3-AMINOCROTONIC ACID

Walter Stamm, Tarrytown, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 5, 1968, Ser. No. 773,636
Int. Cl. C07c *153/00*
U.S. Cl. 260—545 R 1 Claim

Vinyl polymer compositions are stabilized against degradation and discoloration due to heat by adding to the polymer a stabilizing amount of a novel compound of the formula:



3,626,007

HYDRAZODICARBOXYLIC AMIDES AND HERBICIDES CONTAINING SAME

Hermann Windel, Frankenthal, and Adolf Fischer, Mutterstadt, both of Pfalz, Germany, assignors to Badische Anilin & Soda Fabrik Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed May 16, 1968, Ser. No. 729,558
Claims priority, application Germany, May 27, 1967, P 16 42 225.6
Int. Cl. C07c *133/02*
U.S. Cl. 260—554 2 Claims

Substituted hydrazodicarboxylic amides, particularly those substituted by phenyl or cycloalkyl, and methods for controlling unwanted plant growth with said compounds.

3,626,008

NOVEL PHENYL AND NAPHTHALENE SUBSTITUTED OXALIC ACID DIAMIDES USEFUL AS PROTECTION AGENTS AGAINST ULTRAVIOLET IRRADIATION

Hans Rudolf Biland, Basel; Christian Luethi, Meunchenstein, and Max Duennenberger, Frenkendorf, all of Switzerland, assignors to Ciba Limited, Basel, Switzerland

Filed Mar. 14, 1968, Ser. No. 712,943
Claims priority, application Switzerland, Mar. 20, 1967, 4012/67
Int. Cl. C07c *103/33*
U.S. Cl. 260—559 4 Claims

The present invention provides a process for protecting organic materials which may be damaged by exposure to ultraviolet rays, from damage by ultraviolet irradiation, characterized in that an oxalic acid diamide derivative is incorporated with or applied to the surface of the materials to be protected or in front of said materials a filter layer is placed that contains such oxalic acid diamide derivative of the formula:

$Ar_1—NH—CO—CO—B_1$

in which Ar_1 represents a benzene or naphthalene residue, which may be substituted by phenyl, benzazolyl, cyclohexyl, benzoyloxy or aliphatic groups with not more than 20 carbon atoms, and wherein B_1 represents a residue of the partial formula—NH—D_1 or

where D_1 stands for a possibly substituted alkyl group, alkenyl, hydroxyl, cycloalkyl, carboxylic or sulfonic acid group or a functional derivative thereof; Q represents a member selected from the group consisting of hydrogen, hydroxyalkyl, alkoxyalkyl and Q+W represents a piperidino and a morpholino residue and W stands for a member selected from the group consisting of hydroxyalkyl, alkoxyalkyl, acyl, a carboxylic group, a sulfonic acid group, a functional derivative thereof, a residue of the formula—NHW_x (where W_x is hydrogen, alkyl, acyl or phenyl), and an aminoalkyl group whose amino group may be alkylated, cycloalkylated or arylated.

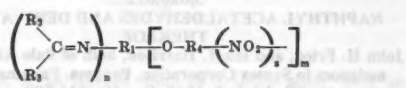
3,626,009

PROCESS FOR THE PRODUCTION OF ALDIMINO- AND KETIMINO-NITROARYL ETHERS

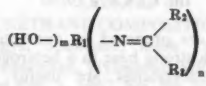
Wilfried Zecher, Cologne-Stammhein, and Rudolf Merten, Leverkusen, both of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed June 10, 1968, Ser. No. 735,523
Claims priority, application Germany, July 12, 1967, F 52932
Int. Cl. C07c *119/00*
U.S. Cl. 260—566 F 2 Claims

Production of aldimino- and ketimino- -nitroaryl ethers of the formula



in which R_1 is (m+n) -valent aryl, R_2 and R_3 each individually is selected from the group consisting of hydrogen, alkyl of up to eight carbon atoms, cycloalkyl, aralkyl, aryl and heterocyclic, with the proviso that R_2 and R_3 when taken together with the adjacent carbon atom to which they are attached form a ring selected from the group consisting of a 5- to 7-membered isocyclic and heterocyclic ring, m and n each individually is a number from one to two, R_4 is (z+l) -valent aryl, and z is an number from one to two, by reacting the corresponding Schiff's base of the formula



in which R_1, R_2, R_3, m and n are the same as defined above with an aromatic halo-nitro compound of the formula

X —R_4 (-NO_2)$_z$

in which X is fluoro, chloro or bromo, and R_4 and z are the same as defined above, e.g. at about −20° to +200° C., in the presence of an acid acceptor; said ethers being intermediates for producing plant protection agents, e.g. fungicides, dyes and plastics auxiliaries, e.g. for preparing polyimide molded bodies.

3,626,010

PREPARATION OF AMINES FROM METAL ARYLOXIDES

Calvin J. Worrel, Detroit, Mich., assignor to Ethyl Corporation, New York, N.Y.

Filed July 31, 1968, Ser. No. 748,918
Int. Cl. C07c *85/02, 85/06*
U.S. Cl. 260—581 11 Claims

Metal aryloxides in which the metal is an alkali metal, alkaline earth metal, aluminum, zinc, titanium, hafnium, zirconium, boron, lead, or niobium are converted to aryl amines by reaction with either ammonia, primary or secondary amines at temperatures from 200°–500° C.

3,626,011

β-DIALKYLAMINOALKYL ETHERS AND THIOETHERS

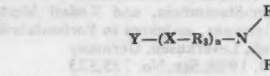
Carl Bordenca, Ponte Vedra Beach, and John M. Derfer, Jacksonville, both of Fla., assignors to SCM Corporation, Cleveland, Ohio

Original application , Ser. No. 607,876, now Patent No. 3,446,843, Continuation-in-part of application Ser. No. 479,009, , now abandoned. Divided and this application July 26, 1968, Ser. No. 747,830

Int. Cl. A01n 9/20; C07c 87/40, 87/127

U.S. Cl. 260—583 EE 8 Claims

Insecticidal β-dialkylaminoalkyl ethers and thioethers of alcohols and mercaptans, for example, of the formula



wherein Y is oleyl or di-isobutenyl carbinyl, R3 is lower alkylene, R1 and R2 are lower alkyl, *n* is an integer of 1 to 3, X is oxygen or sulfur, and when *n* is 1, X is sulfur, and when *n* is 2 or 3, X represents at least one oxygen.

3,626,012

NAPHTHYL ACETALDEHYDES AND DERIVATIVES THEREOF

John H. Fried, and Ian T. Harrison, both of Palo Alto, Calif., assignors to Syntex Corporation, Panama, Panama

Filed July 2, 1968, Ser. No. 741,900

Int. Cl. C07c 47/52

U.S. Cl. 260—599 8 Claims

β-(2-Naphthyl) acetaldehydes optionally substituted at the β position and/or positions C—1, 4, 5, 7 or 8; and/or position C—6 possess anti-inflammatory analgesic, antipyretic and anti-pruritic activity.

3,626,013

PROCESS FOR PRODUCING NITROACETYLENES

Volker Jager, Brussels, and Heinz Gunter Viehe, Linkebeek, both of Belgium, assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,502

Int. Cl. C07c 79/06

U.S. Cl. 260—644 3 Claims

Nitroacetylenes are prepared by contacting a 1-nitro-2-haloethylene with a strong base in a heterogeneous reaction system. The nitroacetylenes are useful reaction intermediates, for instance, they can be reacted with dienes to produce useful compounds.

3,626,014

PROCESS FOR PREPARATION OF ORGANIC PEROXIDES

Robert J. Harvey, Teaneck, N.J., assignor to Halcon International, Inc.

Filed Mar. 11, 1968, Ser. No. 711,845

Int. Cl. C07c 73/00

U.S. Cl. 260—610 11 Claims

This invention relates to an improved process for the production of organic peroxides by reaction between organoboron compounds and organic hydroperoxides or alcohols. The process of this invention is applicable to the manufacture of symmetrical as well as asymmetrical peroxides and in many embodiments is able to produce peroxide from the starting materials in almost quantitative yields. In particularly preferred embodiments this invention relates to the preparation of di-tertiary-alkyl peroxides such as, for example, di (t-butyl) peroxide and di-t-amyl peroxide and to the preparation of di-aralkyl peroxides such as, for example, di (alpha-phenylethyl) peroxide and di-cumyl peroxide.

3,626,015

NOVEL PHOTOCHEMICAL REACTIONS OF TRANS-α-SANTALATE AND NOVEL COMPOUNDS RESULTING THEREFROM

Ronald G. Lewis, Dayton, and William F. Erman, Springfield Township, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Jan. 26, 1968, Ser. No. 700,752

Int. Cl. C07c 35/02; C11b 9/00; C11d 3/065

U.S. Cl. 260—631.5 12 Claims

Ultraviolet irradiation of ethyl trans-α-santalate to obtain, initially, (1) ethyl trans-α-santalate and ethyl cis-α-santalate and, on further irradiation, to obtain the novel compounds, (2) ethyl trans-$\Delta^{11,12}$-α-santalate and ethyl cis-$\Delta^{11,12}$-α-santalate; and the subsequent reduction of these compounds to obtain, with (1), trans-α-santalol and cis-α-santalol and, with (2), novel compounds, trans-$\Delta^{11,12}$-α-santalol and cis-$\Delta^{11,12}$-α-santalol.

3,626,016

ALKYNYLATION OF KETONES AND ALDEHYDES USING COMPLEXES HAVING UTILITY THEREFOR

Kenneth R. Martin, Gastonia, N.C., assignor to Lithium Corporation of America, New York, N.Y.

Filed Jan. 24, 1968, Ser. No. 700,023

Int. Cl. C07c 33/04, 33/06, 35/02

U.S. Cl. 260—638 Y 13 Claims

Ketones and aldehydes are alkynylated, particularly ethynylated, by reacting certain complexes of monoalkali metal alkynyls, such as monolithium acetylide-dimethylsulfoxide complex [(LiC CH)$_2$.CH$_3$—SO—CH$_3$], with a ketone or aldehyde. Novel complexes, such as the foregoing, are also disclosed including a method for the preparation thereof, as by reacting a dimethyl ether complex of methylsulfinylmethyllithium (LiCH$_2$—SO—CH$_3$.CH$_3$O—CH$_3$) with acetylene.

3,626,017

BRIDGEHEAD BROMO-CHLORO ADAMANTANES AND THEIR PREPARATION

Robert E. Moore, Wilmington, Del., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Dec. 7, 1967, Ser. No. 688,679

Int. Cl. C07c 17/20, 23/18

U.S. Cl. 260—648 R 3 Claims

Novel adamantane compounds having a bromo and a chloro substituent at bridgehead positions are prepared by reacting a dibromadamantane with a chloro donor in the presence of a Lewis acid. For example, 1,3-dibromo-adamantane is reacted with carbon tetrachloride in the presence of a mixed Lewis acid catalyst of BBr_3 and $AlBr_3$. The product was a mixture of the 1,3-dibromo-1,3-dichloro-and 1-bromo-3-chloroadamantane.

3,626,018

CHEMICAL PROCESSES USING ORGANOTHALLIUM COMPOUNDS

Edward C. Taylor, 1500 Spring Garden St., Philadelphia, Pa., and Alexander McKillop, East Anglia, Norwich, England

Filed Jan. 25, 1968, Ser. No. 700,352

Int. Cl. C07c 15/14

U.S. Cl. 260—670 7 Claims

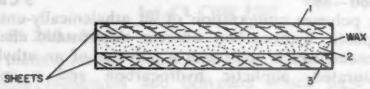
Thallous salts of β-dicarbonyl compounds, prepared by reaction of the β-dicarbonyl compounds with a thallous alkoxide, are treated with alkyl halides to give C-alkyl products in high yield, with acyl halides at room temperature to give C-acyl products, and with acyl halides at low temperatures to give O-acyl products. Thallous phenolates are esterified with acyl or aroyl halides. Anhydrides are also prepared, as are biaryls and bi-sec-alkyls. N-Heterocyclics, including purines and pyrimidines, are N-alkylated. Lactams are O-acylated or N-alkylated.

3,626,019

ADHESIVE COMPOSITION MADE OF A TELEMER OF ETHYLENE ON PSEUDOCUMENE

Ernest P. Black, West Chester, Pa., assignor to Sun Oil Company, Philadelphia, Pa.

Filed Apr. 12, 1968, Ser. No. 720,832
Int. Cl. C07c *3/00*
U.S. Cl. 260—671 2 Claims



Laminating wax of high adhesive characteristics especially useful in the production of intercalated products is obtained by solvent fractionation of a telomer resulting from a telomerization reaction employing pseudocumene as the telogen and ethylene as the taxogen. The reaction producing said telomer is effected by means of a catalyst which is a combination of lithium alkyl with certain types of non-aromatic tertiary amines.

3,626,020

SEPARATION OF PARAXYLENE FROM MIXTURE OF C AROMATIC UTILIZING CRYSTALLINE ALUMINOSILICATE ADSORBENT

Richard W. Neuzil, Downers Grove, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of application Ser. No. 739,176, June, 1968, now Patent No. 3,558,730, dated Jan. 26, 1971. This application Mar. 12, 1969, Ser. No. 806,735
Int. Cl. C07c *7/12*; C10g *25/04*
U.S. Cl. 260—674 SA 20 Claims

A process for the separation of paraxylene from a mixture of at least one other xylene isomer using a synthetically prepared crystalline aluminosilicate adsorbent. A feed mixture comprising at least two xylene isomers is passed through a bed of faujasite adsorbent wherein one xylene isomer is preferentially adsorbed within the adsorbent. A subsequent desorption step is then used to desorb the selectively adsorbed feed component.

3,626,021

DEHYDROGENATION OF ALIPHATICS OVER ALKALI METAL OXIDE-CHROMIA-ZINC ALUMINATE SPINEL CATALYST

Glenn O. Michaels, South Holland; John Mool, Homewood, and LaVern H. Beckberger, Harvey, all of Ill., assignors to Atlantic Richfield Company

Continuation of application Ser. No. 445,778, Apr. 5, 1965, now abandoned. This application July 1, 1968, Ser. No. 741,323
Int. Cl. C07c *5/18*, *3/28*; B01j *11/22*
U.S. Cl. 260—683.3 10 Claims

Branched chain, aliphatic hydrocarbons of five to 10, preferably five to eight, carbon atoms, with the longest continuous carbon-to-carbon chain being four or five carbons long, are dehydrogenated with the aid of a catalyst composition consisting essentially of zinc aluminate spinal, chromia and alkali metal oxide. Vapor phase conditions are employed, including a temperature of about 900° to 1250° F. The dehydrogenation proceeds with a minimum of skeletal isomerization to yield an olefinically unsaturated product having the same skeletal carbon atom arrangement as the hydrocarbon being dehydrogenated. Thus, for example, using the catalyst of the invention neohexane can be dehydrogenated to neohexene in high yields and with a minimum of byproducts.

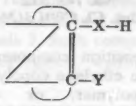
3,626,022

HARDENABLE EPOXY RESIN CONTAINING CHELATES FROM METAL HALIDES, MONOEPOXIDES, AND CHELATE FORMING COMPOUNDS

Hiroshi Suzuki, and Yasusi Nakamura, both of Tokyo, Japan, assignors to Asahidenka Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 10, 1968, Ser. No. 720,360
Claims priority, application Japan, Apr. 13, 1967, 42/23561
Int. Cl. C08g *45/00*, *45/12*
U.S. Cl. 260—830 TW 9 Claims

An epoxy resin composition hardenable at a temperature of from about 0 to 5° C. is made by mixing (A) one or more epoxy compounds containing on the average more than one adjacent epoxy group per molecule, with (B) a hardener produced by reacting (1) at least one compound selected from the group consisting of boron halide, aluminum family metal halides, ferric halide and functional derivative thereof with (2) at least one liquid mono-1, 2-epoxide and (3) at least one aromatic chelate-forming compound having the formula



wherein X is an oxygen atom or a sulfur atom, Y is an organic radical containing an oxygen atom, a sulfur atom and a nitrogen atom and which can co-ordinate to said metal and Z is an organic radical which will make

so as to represent a divalent aromatic radical.

3,626,023

URETHANE COMPOSITIONS

Bernardas Brizgys, Southgate, Mich., assignor to BSAF Wyandotte Corporation, Wyandotte, Mich.

Filed Nov. 1, 1967, Ser. No. 679,615
Int. Cl. C08g *37/32*
U.S. Cl. 260—849 9 Claims

The subject matter of the present application relates to polyurethane compositions. As disclosed herein, the polyurethane compositions are prepared by heating a composition which comprises polyoxyalkylene polyol, organic polyisocyanate, alkoxyalkylamino compound, acid catalyst, and metallo-organic catalyst.

3,626,024

STABILIZED POLYACETALS AND PROCESS FOR THEIR MANUFACTURE

Klemens Gutweiler; Edgar Fischer, both of Frankfurt am Main, and Klaus-Dieter Asmus, Hofheim, Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Filed Mar. 26, 1968, Ser. No. 715,954
Int. Cl. C08g *37/32*
U.S. Cl. 260—849 10 Claims

Stabilization of polyacetals with the use of a homocondensate of hydroxymethyl cyanoguanidine as stabilizer in combination with known oxidation stabilizer.

3,626,025

COMPATIBLE POLYMERS

Harry D. Anspon, Pittsburgh, Pa., and Richard L. Alexander, Greensburg, Ind., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Continuation of application Ser. No. 443,045, Mar. 26, 1965, now Patent No. 3,427,296. This application Apr. 22, 1968, Ser. No. 723,047

Int. Cl. C08g *41/04*; C08f *15/02*

U.S. Cl. 260—857 2 Claims

Blended polymer compositions containing random interpolymers of ethylene and 1-vinyl-2-pyrrolidinone.

3,626,026

HOTMELT ADHESIVE COMPOSITIONS

Masuo Fukumura, Tokyo-to; Haruo Takahashi, Hiratsuka-shi; Shihoko Kawabe, and Hajime Fukke, both of Tokyo-to, all of Japan, assignors to Kabushiki Kaisha Hitachi Seisakusho, Tokyo-to, Japan

Continuation-in-part of application Ser. No. 594,681, Nov. 16, 1966, now abandoned. This application Aug. 1, 1968, Ser. No. 749,312

Int. Cl. C09j *3/26*

U.S. Cl. 260—857 1 Claim

An adhesive composition composed of 50–95 parts by weight of at least one ethylene copolymer such as ethylene vinyl acetate copolymer, or ethylene-ethylacrylate copolymer, and 5–50 parts by weight of thermoplastic resin such as chlorinated polyethylenes, polyamides, polyesters, phenoxy resins, polyvinylbutyral, or ionomer resins.

The adhesive composition can further contain a conditioning agent, or it can be composed of 25–85 parts by weight of one or more ethylene copolymer such as ethylene vinyl acetate copolymer or ethylene-ethylacrylate copolymer, 5–50 parts by weight of thermoplastic resin such as chlorinated polyethylene, polyamides, polyesters, phenoxy resins, polyvinylbutyral, or ionomer resins, and 10–70 parts by weight of the conditioning agent such as low-molecular-weight polyethylenes, turpentine resins, or petroleum resins.

3,626,027

PROCESS FOR PRODUCING A GRAFT COPOLYMER COMPOSITION HAVING A POLYETHER AS ONE COMPONENT

Atsushi Tanaka; Hideo Sawada, and Hirotaka Toba, all of Iruma-gun, Japan, assignors to Daicel Limited

Filed Aug. 5, 1968, Ser. No. 749,947

Claims priority, application Japan, Aug. 4, 1967, 42/50104

Int. Cl. C08g *43/02*

U.S. Cl. 260—874 2 Claims

A process is disclosed and claimed for producing a graft copolymer composition, (e.g., polyether). The composition is prepared by adding and mixing more than an equivalent of an aliphatic polyether polymer with a polymer having an acid ester, acid anhydride, alcohol ester or acetal or alcohol group side chain, in the presence of a solvent solution. The mixture is then heated and a Lewis acid is added under agitation.

The graft copolymer compositions are useful in molding applications.

3,626,028

THERMOPLASTIC, RIGID RESINOUS COMPOSITION AND METHOD OF MAKING SAME

Elmer J. De Witt, 3154 Prior Drive, Cuyahoga Falls, Ohio

Filed May 13, 1968, Ser. No. 728,848

Int. Cl. C08f *29/12*, *29/22*

U.S. Cl. 260—878 7 Claims

A rigid, thermoplastic resinous blend comprises a rigid vinyl chloride base resin such as polyvinyl chloride and from about 0.5 percent to about 8 percent/wt., based on the weight of the base resin, of an amorphous, low molecular weight polypropylene. The blend has greatly improved melt flow properties and also a resistance to distortion by heat which is essentially equal to or superior to those of the base resin. The preferred method of making such a blend involves dissolving an amorphous polypropylene soluble in vinyl chloride in the base resin monomeric mixture and carrying out the polymerization thereof in aqueous suspension to produce a granular vinyl chloride resin in which the polypropylene, normally highly incompatible with vinyl chloride resins, is uniformly dispersed in a physical sense.

3,626,029

POLYMER COMPOSITION OF SUPPRESSED ELECTROSTATIC CHARGES

David W. Young, Homewood, Ill., assignor to Atlantic Richfield Company, New York, N.Y.

Filed Apr. 26, 1968, Ser. No. 724,607

Int. Cl. C08f *45/58*

U.S. Cl. 260—889 5 Claims

A solid polymer composition of an ethylenically-unsaturated, aliphatic hydrocarbon wherein electrostatic charges are suppressed which comprises a polymer of an ethylenically-unsaturated, aliphatic hydrocarbon and a minor amount, sufficient to suppress the accumulation of electrostatic charges, e.g. about 0.05 to 5 wt. percent, based on the solid polymer, of a polyhydroxy polymer of a 1,3-diene of four to about 12 carbon atoms. The polyhydroxy polymer has an average of at least about 1.8 predominently primary, terminal allylic hydroxyl groups per molecule, a viscosity at 30° C. of about 5 to 20,000 poises and a number average molecular weight of about 400 to 25,000.

3,626,030

STABILIZED MACROMOLECULAR POLYACETALS AND PROCESS FOR MAKING THE SAME

Ernst Wolters, and Michael Lederer, both of Frankfurt am Main, Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt am Main, Germany

Continuation-in-part of application Ser. No. 634,487, Apr. 28, 1967, now Patent No. 3,531,451, Continuation-in-part of application Ser. No. 679,517, Oct. 31, 1967, now abandoned. This application Feb. 17, 1970, Ser. No. 12,144

Claims priority, application Germany, May 17, 1966, F 49223

Int. Cl. C08f *33/08*

U.S. Cl. 260—895 10 Claims

Improved stabilization of polyacetals against thermal and oxidative degradation, particularly stabilization of homopolymers of formaldehyde or its cyclic oligomers and of copolymers of trioxane with cyclic ethers or cyclic acetals is obtained by using a stabilizing agent which is a homopolymer of a poly-N-vinyl-azetidinone or a copolymer of an N-vinyl-azetidione and a minor amount of an olefinically unsaturated comonomer or mixtures of such homopolymers and copolymers. The stabilizing agents may be used in an amount of 0.05 to 10 percent by weight. Further improvement in stabilization is achieved by using the poly-N-vinyl-azetidinone stabilizing agents in combination with conventional phenolic stabilizers in that a synergistic effect between the two types of stabilizers is obtained.

3,626,031

VINYL HALIDE POLYMER STABILIZED WITH PARTIAL ESTER SALT OF MALEIC ANHYDRIDE-VINYL COMPOUND POLYMER

Robert R. Chambers, Scarsdale, N.Y.; Henry V. Isaacson, Minneapolis, Mich., and David W. Young, Homewood, Ill., assignors to Atlantic Richfield Company

Continuation-in-part of application Ser. No. 607,150, Jan. 4, 1967, now Patent No. 3,472,772. This application June 4, 1968, Ser. No. 734,202

Int. Cl. C08f *29/22*

U.S. Cl. 260—899 6 Claims

Novel tin salts of partial esters of vinyl monomermal anhydride polymers, (e.g. styrene-maleic anhydride polymers), esterified with a thioalcohol or a hydroxythioether are formed by combination of the ammonium salt of said

thioester and stannous chloride. Vinyl halide polymers are stabilized by incorporation of small amounts of these tin salts.

3,626,032

PREPARATION OF POLY-α,α,2,3,5,6,-HEXAFLUORO-P-XYLYLENE

William P. Norris, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 24, 1968, Ser. No. 723,908
Int. Cl. C08f 3/00
U.S. Cl. 260—91.5 3 Claims

A method for the preparation of new highly fluorinated p-xylylene monomers and polymers which have excellent chemical and thermal properties.

3,626,033

VINYL CHLORIDE RESINS WITH HIGH HEAT DEFORMATION AND IMPACT

Henno Keskkula, Midland, and Arthur A. Pettis, Saginaw, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Nov. 12, 1968, Ser. No. 775,100
Int. Cl. C08f 29/24, 41/12
U.S. Cl. 260—876 R 8 Claims

High heat deformation and high impact vinyl chloride resins are prepared by blending a resin such as polyvinyl chloride or copolymers of vinyl chloride containing at least about 80 percent vinyl chloride with a polydiene rubber nitrile graft copolymer such as a styrene/acrylonitrile polybutadiene graft copolymer and an anhydride containing copolymer such as styrene-maleic anhydride.

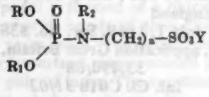
3,626,034

DIALKYL PHOSPHORYL N-ALKYLTAURINATES

Ralph B. Fearing, Bardonia, N.Y., assignor to Stauffer Chemical Company, New York, N.Y.

Filed Nov. 29, 1967, Ser. No. 686,747
Int. Cl. C07f 9/24; D06l 1/04
U.S. Cl. 260—947 1 Claim

A composition of matter useful in the process of dry cleaning clothing consisting essentially of the formula:



wherein R is an alkyl group containing from six to 16 carbon atoms; R_1 is an alkyl group containing from six to 16 carbon atoms; R_2 can be hydrogen, an alkyl group containing from one to eight carbon atoms or an aryl group containing from one to eight carbon atoms; Y is selected from the group consisting of sodium, potassium, ammonium and mixtures thereof, and n is an integer from one to four.

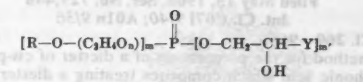
3,626,035

SURFACE ACTIVE NONIONIC 2-HYDROXYALKYL 3-ALKOXY-2-HYDROXYALKYL PHOSPHATE ESTERS

Robert Ernst, Los Angeles, Calif., assignor to Textilana Corporation, Hawthorne, Calif.

Filed Nov. 5, 1968, Ser. No. 773,627
Int. Cl. C07f 9/08
U.S. Cl. 260—951 10 Claims

Surface active nonionic 2-hydroxyalkyl and 3-alkoxy-2-hydroxyalkyl phosphate esters having one or two higher alcohol or alkylphenol oxyethylate radicals, and conforming to the following general formula:



where R is a linear or branched alkyl group having eight to 18 carbon atoms, of which at least six are in an uninterrupted carbon-to-carbon chain, or an alkylphenyl group having eight to 15 carbon atoms in a linear or branched alkyl group, of which the alkyl substituent has at least four carbon atoms in an uninterrupted carbon-to-carbon chain, which may be branched but is Y is hydrogen or an alkyl group with an uninterrupted carbon chain of one to 16 carbon atoms, or a methoxyalkyl group $—CH_2—O—R'$, where R' is an alkyl radical having one to 18 carbon atoms; n is a number of two to 20; m is a number of one or two; m' is a number of one or two; and $m + m'$ equals 3. Such compounds being useful as detergents, drycleaning agents, wetting agents, emulsifiers and lubricants.

3,626,036

O-METHYL-O-(2,2 DICHLORO-VINYL) PHOSPHORIC ACID ESTER MONOCHLORIDE AND METHOD OF PREPARATION

Wilhelm Sirrenberg, Sprockhoevel; Wolfgang Behrenz, and Ingeborg Hammann, both of Cologne, all of Germany, assignors to Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 1, 1967, Ser. No. 687,162
Claims priority, application Germany, Dec. 13, 1966, F 50914
Int. Cl. A01n 9/36; C07f 9/20, 9/24
U.S. Cl. 260—957 5 Claims

Reacting O,O-dimethyl-0-(2,2-dichloro-vinyl)-phosphoric acid ester with phosphorus pentachloride, or with phosphorus trichloride and chlorine, e.g. at about 40°–130° C., to form 0-methyl-0-(2,2-dichloro-vinyl)-phosphoric acid ester monochloride, and reacting said monochloride with ammonia or a primary or secondary amine, e.g. at a temperature up to about room temperature, in the presence of an acid binding agent to form the corresponding O-methyl-O-(2,2-dichloro-vinyl)-phosphoric acid ester amide, some of which are known, and which possess arthropodicidal properties.

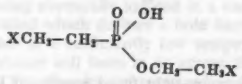
3,626,037

MONO-2-HALOETHYL ESTERS OF 2-HALOETHANEPHOSPHONIC ACID

David I. Randall, and Robert W. Wynn, both of Easton, Pa., assignors to GAF Corporation, New York, N.Y.

Filed Mar. 5, 1968, Ser. No. 710,652
Int. Cl. A01n 9/36; C07f 9/40
U.S. Cl. 260—961 2 Claims

Mono-2-haloethyl esters of 2-haloethanephosphonic acid represented by the formula:



wherein both X's represent the same halogen, i.e. either bromine or chlorine, preferably chlorine. The compounds are plant growth regulators comparable 2-chloroethanephosphonic acid.

3,626,038

PROCESS FOR PREPARING DIESTERS OF CIS-PROPENYL-PHOSPHONIC ACID

Nathan G. Steinberg, Plainfield, N.J., assignor to Merck & Co. Inc., Rahway, N.J.

Filed May 15, 1968, Ser. No. 729,448
Int. Cl. C07f 9/40; A01n 9/36
U.S. Cl. 260—968 4 Claims

A method for the preparation of a diester of cis-propenyl-phosphonic acid which comprises treating a diester of ethynyl phosphonic acid with tetramethyl diborane to afford a transdiester of [2-dimethylboryl)vinyl] phosphonic acid, which intermediate, upon treatment with iodine in the presence of a base, yields the desired product. The product thus obtained is an intermediate which may be converted to cis-propenylphosphonic acid and then to the antimicrobially active (-) (cis-1,2-epoxypropyl) phosphonic acid and its salts.

3,626,039

PROCESS FOR THE PREPARATION OF CHLOROALKYL-S-ALKYL-AND ARYL- (D1) THIOL-PHOSPHORIC ACID DIESTER AND ESTER AMIDE CHLORIDES

Hellmut Hoffmann, Wuppertal-Elberfeld, Germany, assignor to Farbenfabriken Bazer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of application Ser. No. 704,515, Feb. 12, 1968, now abandoned. This application May 8, 1968, Ser. No. 727,738
Int. Cl. C07d 105/04; C07f 9/24, 9/26
U.S. Cl. 260—971 12 Claims

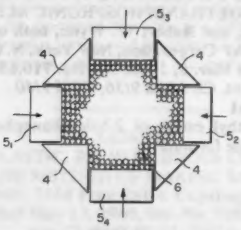
Reacting 2-chloro-(optionally 4-chloro lower alkyl)-1,3-(dioxa, oxa-thia or oxa-aza)-2-(phospholanes or phosphorinanes) with alkyl, oxo-alkyl (i.e. carbonyl-alkyl or aldehydo-alkyl), halo-alkyl, phenyl or alkyl-, halo- and/or nitro-substituted phenyl sulfenylchlorides, for example at about −20 to +50° C., optionally in the presence of an inert organic solvent, to form the corresponding (O-, S- and N-chloro-substituted alkyl)-S-(alkyl, oxo-alkyl, haloalkyl, phenyl and alkyl-, halo- and/or nitro- substituted phenyl)-diester chlorides and ester amide chlorides, which are known intermediates usable in the known way for producing known insecticides, fungicides and other plant protection agents.

3,626,040

METHOD OF MAKING FUSED BUNDLES OF LIGHT-CONDUCTING FIBERS

Kazuyoshi Nagao, and Akihiko Katsura, both of Yokohama, Japan, assignors to American Optical Corporation, Southbridge, Mass.

Filed Oct. 6, 1969, Ser. No. 863,962
Int. Cl. B29d 11/00
U.S. Cl. 264—1 3 Claims



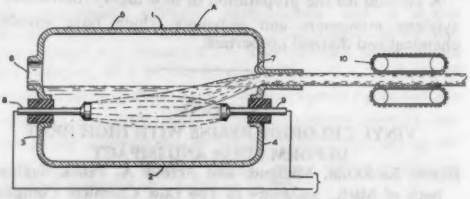
Forming a vacuum-tight fused bundle of light-conducting fibers in a compression mold. An elongated mold having a cross cavity with a plunger closing each of the four sides thereof is filled with light-conducting fibers extending along the length of the cavity in side-by-side parallel relationship with each other. The fibers are heated to fusing temperature and the plungers are all simultaneously forced against the fibers toward a central axis through the cavity under uniform high pressure whereby a substantially uniform pattern of individual fiber distortion is produced throughout the resulting fused bundle of fibers.

3,626,041

APPARATUS AND PROCESS FOR MAKING CONTINUOUS FILAMENT

Joseph E. Fields, and Edward H. Mottus, both of Ballwin, Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Nov. 13, 1968, Ser. No. 775,243
Int. Cl. B29h 1/02; B06b 1/02; B01d 13/02
U.S. Cl. 264—24 11 Claims



A process for making a continuous filament from discrete particulate matter including particles and fibers and mixtures thereof which may be initially packed and oriented in any random fashion. The particulate matter is added to a reaction vessel having a pair of electrodes therein. A strong electrokinetic field is established in this vessel and this electrokinetic field will untangle and properly orient the various random fibers and particulate matter through its influence. This action will cause close packing of the particulate matter in a desired pattern. Furthermore, the orientation is made to take place in a polymeric composition or resin matrix system so that the particulate matter is not only oriented, but held in the oriented position without the aid of the electrokinetic field. During the process of alignment and polymerization or partial polymerization, the continuous filament is formed and simultaneously removed outwardly from the vessel and then fully cured.

3,626,042

MANUFACTURE OF VITREOUS CARBON BODIES

Harry Appleby, and Frederick Claud Cowlard, both of Ilford, England, assignors to The Plessey Company Limited, Ilford, Essex County, England

Filed July 1, 1969, Ser. No. 838,326
Claims priority, application Great Britain, July 12, 1968, 33,490/68
Int. Cl. C01b 31/02
U.S. Cl. 264—29 4 Claims

Vitreous carbon bodies are produced by assembling a plurality of phenol-formaldehyde resinous bodies into a unitary composite body having a layer of a curable phenolic resin adhesive interposed between the contiguous surfaces, curing the adhesive while the surfaces are maintained in contact by external pressure, and firing the composite body to convert it to a unitary vitreous carbon body.

3,626,043

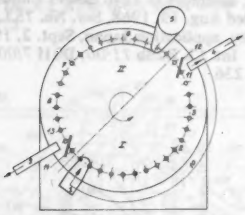
LUBRICATION PROCESS

Alfred Jean P. Flipot, Geel, and Armand Georges Smolders, Olmen, both of Belgium, assignors to Belgonucleaire, S.A. and Centre d'Etude de l'Energie Nucleaire, Bruxelles, Belgium

Filed June 25, 1969, Ser. No. 836,343
Claims priority, application Belgium July 5, 1968, July 5, 1968; 717646, 717647
Int. Cl. B29c 1/04
U.S. Cl. 264—37 5 Claims

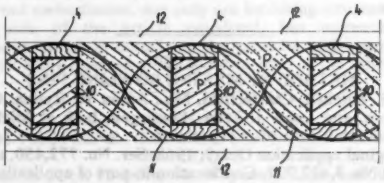
The specification discloses processes for lubricating com-

paction presses, including automatic presses having double-



sided rotary press heads, with solid lubricants.

3,626,044
PROCESS FOR MANUFACTURING A CURVED COMPOSITE FOAMED PANEL
Guy Arnaud, Route de Peney, Satigny, Switzerland
Filed Nov. 10, 1969, Ser. No. 875,598
Claims priority, application Switzerland, Nov. 8, 1968, 16700/68
Int. Cl. B29d *27/04*
U.S. Cl. 264—45 **10 Claims**



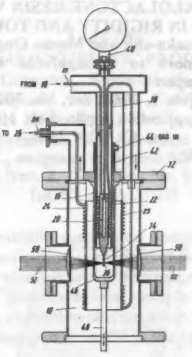
A partition or panel is formed of a plurality of reinforcing elements interlaced with bands of glass cloth and embedded in a polymerized resin foam. The reinforcing elements comprise a core of polymerized resin encased in a layer of glass fabric between a pair of laths. The reinforcing elements can be made with curved shapes by moulding between flat surfaces. The partition can be given a complex curvature by placing the reinforcing elements and interlaced glass cloth in a shuttering composed of a supple plastic sheet outwardly reinforced with laths transverse of the reinforcing elements and pouring an expansible resin foam, thereby eliminating the rigid conventional mould.

3,626,045
PROCESS FOR MAKING TUBULAR FILAMENTS
Calvin R. Woodings, Nuneaton, England, assignor to Coustaulds Limited, London, England
Filed Dec. 15, 1969, Ser. No. 884,808
Claims priority, application Great Britain, Dec. 20, 1968, 60,676/68
Int. Cl. D01f *3/10*
U.S. Cl. 264—54 **4 Claims**

A controllable commercial process for producing tubular regenerated cellulose filaments comprises extruding a viscose of a specific composition and containing sodium carbonate into a sulfuric acid spin bath of a specific composition to form filaments followed by stretching of the filaments. Tubular filaments with increased wet modulus and a tendency to

crimp are produced by stretching the filaments by an amount approaching their breaking stretch.

3,626,046
METHOD OF MAKING A SOLIDIFIED DISC FROM MATERIAL WHICH IS A GAS AT ROOM TEMPERATURE
Horst Krause, and Richard Sigel, both of Garching, Germany, assignors to Institut fur Plasmaphysik G.m.b.H., Munich, Germany
Filed Dec. 16, 1969, Ser. No. 885,545
Claims priority, application Germany, Dec. 16, 1968, P 18 14 884.4
Int. Cl. B29c *13/00*; B29d *3/00*
U.S. Cl. 264—81 **3 Claims**



A method for making a thin, self-supporting disc from a substance, such as hydrogen, which is a gas at room temperature said disc being eventually located in a vacuum. A metal member is provided which defines a hole having a diameter small enough that at a sufficiently low temperature a liquid film of the substance will form in or across the hole due to surface tension. The atmosphere surrounding the hole is first reduced to a high vacuum and then the space or zone surrounding the hole is made smaller. A predetermined quantity of the gas to be solidified is brought into this lesser space and a cryogen cools the gas below its boiling point. This causes the gas to condense on the surface of the metal member and form a liquid film in the hole. The liquid film is further cooled until it solidifies in the form of a thin, self-supporting

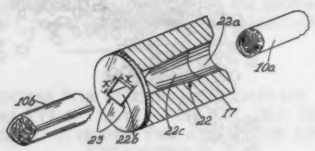
disc. An apparatus including a diffusion pump, a vacuum chamber, and a reciprocating glass bell within the vacuum chamber is provided to carry out the method.

3,626,047

METHOD OF PRODUCING A WAX MATCH SHAFT

Cecil Illovo Kessler, Johannesburg, South Africa, assignor to Chet Industries (Proprietary) Limited

Filed Oct. 6, 1969, Ser. No. 863,948
Claims priority, application South Africa, Oct. 14, 1968, 68/6627
Int. Cl. B29c *17/02*, *17/10*; B29d *23/10*
U.S. Cl. 264—136 7 Claims



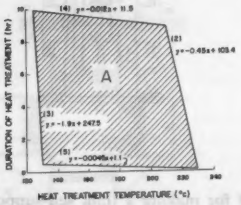
A method of producing a shaft for a wax match which comprises the steps of continuously coating a web of combustible sheet material, such as paper, with a suitable impregnating material, such as wax; continuously compacting the web of sheet material into an elongated element of generally rounded cross-sectional configuration; progressively deforming the rounded element to present a polylateral, preferably a quadrilateral, cross-sectional configuration with concave sides; allowing the deformed element to expand radially to reduce the concavity of the sides and preferably form a rectilinear polylateral cross-sectional configuration; and severing the element into individual match shafts.

3,626,048

METHOD FOR MANUFACTURING MOLDED ARTICLES OF POLYPIVALOLACTONE RESIN WHICH ARE SUPERIOR IN RIGIDITY AND TOUGHNESS

Tohru Kitazawa, Osaka-shi, and Masao Onga, Kobe-shi, both of Japan, assignors to Kanegafuchi Boseki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 2, 1968, Ser. No. 702,642
Claims priority, application Japan, Feb. 10, 1967, 42/8731
Int. Cl. B29f *3/08*
U.S. Cl. 264—176 R 10 Claims



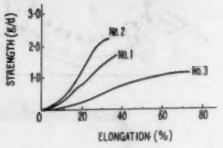
A method for manufacturing molded articles of polypivalolactone resin which have highly increased mechanical properties, especially in toughness, said cell comprising subjecting highly crystalline molded plastic articles of polypivalolactone resin having an intrinsic viscosity [η] in the range of 1.5–4 to heat treatment under the treatment conditions consisting of temperature and duration which are both in ranges specified.

3,626,049

PROCESS FOR PRODUCING CROSS-LINKED ACRYLIC FIBERS OR FILMS

Akira Yamamoto; Kunio Nakaoji; Kunio Oohara; Zenjiro Momiyama; Heiichiro Murakami, and Akira Tomita, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha

Filed Aug. 19, 1968, Ser. No. 753,515
Claims priority, application Japan, Sept. 2, 1967, 42/56502
Int. Cl. B28b *11/00*; D01f *7/00*
U.S. Cl. 264—236 14 Claims



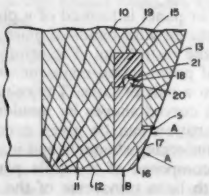
Cross-linked acrylic fibers or films which are of improved hot water-resistance and have a silky hand or feel, are obtained by (i) preparing an acidic solution of a copolymer obtained by copolymerizing in an acidic medium (a) a vinyl monomeric material consisting mainly of acrylonitrile and (b) a polymerizable unsaturated monomer having a halogenated s-triazinyl group or halogenated pyrimidinyl group in the presence of (c) a polymerizable unsaturated monomer having a group containing active hydrogen, a group capable of forming active hydrogen, a pyridyl group, a pyrazinyl group or quinolyl group, and/or (d) protein, and then (ii) extruding a very stable acidic solution of the resulting polymer into the form of fibers or films, and then heat-treating. The obtained fibers, for example, are useful in making woven or knitted fabrics of correspondingly superior properties.

3,626,050

METHOD OF MAKING BOWLING PINS

Fred E. Satchell, Chesterfield, Mo.; Anton W. Rytina, Grand Haven, and Louis J. Trier, Muskegon, both of Mich., assignors to Brunswick Corporation

Original application Oct. 9, 1968, Ser. No. 772,450, now Patent No. 3,477,721, Continuation-in-part of application Ser. No. 520,974, Jan. 17, 1966, now abandoned. Divided and this application Aug. 20, 1969, Ser. No. 851,615
Int. Cl. B29d *3/00*; B29h *9/00*; B29b *3/00*
U.S. Cl. 264—263 4 Claims

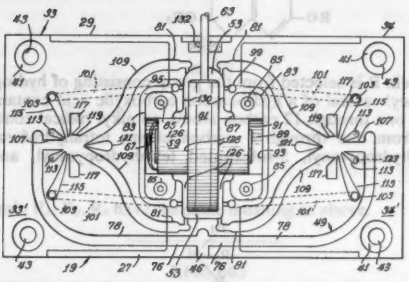


A method of manufacturing a pin bottom for use in combination with a bowling pin which has a central reduced shank at its butt end formed by an undercut at the juncture of the bottom surface and side surface of the pin, with the undercut forming a downwardly facing annular groove. The pin bottom comprises a flexible upper base member which embraces the shank and is positioned entirely at the uppermost areas of the groove and bonded thereto. A wear-resistant lower base member extends at its upper end into the groove and terminates at its lower end in a shoulder which defines a continuation of the bottom and side surfaces of the bowling pin. The two base members are mechanically interlocked to form the pin bottom and to releasably secure the lower base member on the bowling pin.

3,626,051
INJECTION MOLDING ENCAPSULATION OF PAPER-WOUND FLYBACK TRANSFORMERS AND THE LIKE

James P. Liautaud, 141 Grissom Lane, Hoffman Estates, Ill.

Filed Sept. 19, 1969, Ser. No. 859,361
Int. Cl. B29c *6/02*; B29f *1/08*
U.S. Cl. 264—272 2 Claims



High speed, high pressure, close tolerance plastic encapsulation of electrical and electronic articles having fragile portions is accomplished by an injection molding method which includes dividing the incoming stream of plastic into a plurality of substantially equal streams prior to entry of plastic into the mold cavity, and directing the equal streams into the cavity along injection lines which pass through channels between the sides of the article and the cavity walls. These lines are parallel to the sides of the article, and are not directed against the fragile portion. In a preferred embodiment air, venting from the cavity being filled, is employed to automatically assist in the equalization of the streams. In this preferred embodiment, not only are incoming streams at the same side of the article equalized, but moreover the technique assists in equalizing the pressure and quantity of material being injected along opposite sides of the article.

3,626,052
POLYISOPRENE-NEOPRENE METEOROLOGICAL BALLOONS

Nicholas A. Sisco, 96 Loker St., Wayland, Mass., and Andrew J. Kelly, 32 Vogel St., West Roxbury, Mass.

Filed June 24, 1969, Ser. No. 836,167
Int. Cl. B64b *1/40*
U.S. Cl. 264—301 9 Claims

A polyisoprene-neoprene latex in combination with a plasticizer is used to fabricate meteorological balloons.

3,626,053
METHOD OF MOLDING THERMOPLASTIC SHEET MATERIAL

Peter H. Hofer, Berkeley Heights, N.J., assignor to Union Carbide Corporation

Filed Mar. 19, 1968, Ser. No. 714,205
Int. Cl. B29c *3/00*
U.S. Cl. 264—322 8 Claims

This invention relates to a method of molding thermoplastic sheet material by heating the thermoplastic sheet material to its softened state, forming the heat softened material into a shaped article and then allowing the shaped article to undergo a shrinkage with respect to its thickness while maintaining the length and width of the shaped article substantially constant.

3,626,054
LUPUS ERYTHEMATOSUS SKIN TEST

Richard O. Ores, Leonia, N.J., assignor to Bard-Hamilton Company, Inc., East Paterson, N.J.

Filed Oct. 25, 1967, Ser. No. 677,868
Int. Cl. G01n *31/00*, *33/16*
U.S. Cl. 424—9 3 Claims

The invention pertains to an aqueous intradermal injection composition containing deoxyribonucleic acid and 0.36–0.7 percent of alkali metal chloride and a buffer, preferably a phosphate buffer. The pH is in the range of 6.9–8. Intradermal injection of the composition evokes induration encircled by erythema at the area surrounding the injection site on persons suffering from systemic lupus erythematosus. The deoxyribonucleic acid may be sterilized by contact with ethylene oxide prior to preparation of the aqueous composition.

3,626,055
METHOD FOR PRODUCING ANTIBIOTIC T-2636

Eiji Higashide, Kawamo, Takarazuka; Motoo Shibata, Toyonaka, Osaka; Setsuo Harada, Suita, Osaka; Toyokazu Kishi, Nara, Nara, and Komei Mizuno, Settsu, Osaka, all of Japan, assignors to Takida Chemical Industries, Ltd., Osaka, Japan

Filed May 17, 1968, Ser. No. 730,113
Claims priority, application Japan, May 18, 1967, May 8, 1968; 42/31613, 43/31080
Int. Cl. A61k *21/00*
U.S. Cl. 424—120 11 Claims

Antibiotics T–2636–A, T–2636–B, T–2636–C and T–2636–D, produced by fermentative culturing of *Streptomyces rochei var. volubilis* or a mutant or variant thereof, are useful, e.g. in topical preparations for the treatment of infections due to *Staphylococci*, e.g. *Staphylococcus aureus*.

3,626,056
ORAL ANTIBIOTIC PRODUCT

Alphonse Peter Granatek, Baldwinsville; Bernard Charles Nunning, Liverpool; Nicholas George Athanas, East Syracuse; Robert Lewis Dana, Liverpool; Edmund Stanley Granatek, Baldwinsville, and Raymond George Daoust, De Witt, all of N.Y., assignors to Bristol-Myers Company

Filed Nov. 2, 1967, Ser. No. 680,008
Int. Cl. A61k *27/00*
U.S. Cl. 424—35 25 Claims

An aqueous penicillin suspension comprising coated particles of certain penicillins such as dicloxacillin, the coating comprising ethylcellulose and a pharmaceutically acceptable wax, an aqueous pharmaceutical vehicle and kaolin or colloidal magnesium aluminum silicate when administered orally to animals including man is useful in the treatment of bacterial infections.

3,626,057
METHOD OF PRODUCING TETANUS ANTITOXIN

Malik M. Sarwar, Cincinnati, Ohio, assignor to The Immune Milk Company of America, Inc., Cincinnati, Ohio

Continuation-in-part of application Ser. No. 747,106, July 24, 1968, now abandoned, Continuation-in-part of application Ser. No. 505,023, Oct. 24, 1965, now abandoned. This application Sept. 24, 1969, Ser. No. 860,815
Int. Cl. A61k *27/00*
U.S. Cl. 424—87 4 Claims

A method of producing tetanus antitoxin from the milk system of a cow by hyperimmunization of cows, which are free from Brucellosis and Tuberculosis, with tetanus toxoid and subsequently with toxin, collecting the milk from said hyperimmunized cows, extracting the tetanus antitoxin from said milk by the ammonium sulfate precipitation method and

determining the potency of the antitoxin by a toxin-antitoxin neutralization test.

3,626,058

ANTHELMINTIC USE OF 4-PHENYLAZOPHENYLISOTHIOCYANATE

Robert J. Balske, Creve Coeur, Mo., assignor to Monsanto Company, St. Louis, Mo.

Filed Mar. 9, 1970, Ser. No. 17,905
Int. Cl. A61k 27/00
U.S. Cl. 424—226 5 Claims

Usage of 4-phenylazophenylisothiocyanate in combating helminthiasis in animals, particularly ruminants and the monogastric animals.

3,626,059

TRIHYDROXYPHENYLALANINE FOR TREATMENT OF HYPERTENSION

Balthasar Hegedus, Binningen, Switzerland; Hans Thoenen, Bethesda, Md., and Marcel Scheer, Basel, Switzerland, assignors to Hoffman-La Roche Inc., Nutley, N.J.

Filed July 22, 1968, Ser. No. 746,311
Claims priority, application Switzerland, July 27, 1967, 10768/67
Int. Cl. A61k 27/00
U.S. Cl. 424—319 2 Claims

3,4,5-Trihydroxyphenylalanine, its acid and base addition salts and optical isomers thereof are useful as oral therapeutic agents for the treatment of hypertension.

3,626,060

AGRICULTURAL COMPOSITIONS AND PROCESS FOR UTILIZING SAME

Nathaniel Grier, Englewood, N.J., assignor to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of application Ser. No. 733,748, May 29, 1968, which is a continuation of application Ser. No. 417,506, Dec. 10, 1964, now abandoned, Continuation-in-part of application Ser. No. 758,555, Sept. 2, 1958, now abandoned, Continuation-in-part of application Ser. No. 231,813, Oct. 19, 1962, now Patent No. 3,297,525. This application Jan. 12, 1970, Ser. No. 2,388. The portion of the term of the patent subsequent to Jan. 10, 1984, has been disclaimed.
Int. Cl. A01n 9/22
U.S. Cl. 424—232 6 Claims

Antimicrobial compositions containing salts of an organic carboxylic ester of an hydroxyquinoline and a salicylic acid are useful antimicrobials for agricultural applications.

ERRATUM

For Class 424—238 see:
Patent No. 3,625,194

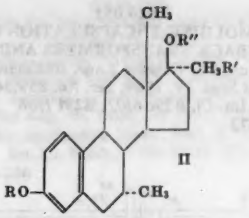
3,626,061

COMPOSITIONS COMPRISING 7α-METHYL-17α-ALKYLATED ESTRADIOLS

John C. Babcock, and J. Allan Campbell, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 114,621, June 5, 1961, now Patent No. 3,341,557, Continuation-in-part of application Ser. No. 69,557, Nov. 6, 1960, now abandoned. This application Sept. 8, 1967, Ser. No. 666,466
Int. Cl. C07c 169/08
U.S. Cl. 424—238 6 Claims

This invention relates to novel 7α-methyl-17α-alkylated estradiols and processes for their preparation; more particularly to those compounds embraced by the formula (II)



wherein R is selected from the group consisting of hydrogen, the acyl radical of a hydrocarbon carboxylic acid containing from one through 12 carbon atoms, an alkyl radical containing from one through 8 carbon atoms, tetrahydrofuranyl, tetrahydropyranyl, 5-substituted tetrahydropyranyl, and a silyl

selected from the group consisting of alkyl of one through eight carbon atoms and phenyl, R′ is selected from the group consisting of hydrogen, methyl, ethyl and 1-propynyl, and R″ is selected from the group consisting of hydrogen, the acyl radical of a hydrocarbon carboxylic acid containing from one through 12 carbon atoms, and a silyl radical of the formula

It also relates to 7α-methyl-17α-alkenylestradiols (11*a*) and their preparation.

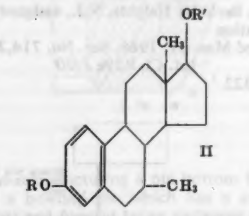
3,626,062

COMPOSITION COMPRISING 7α-METHYL ESTRADIOL 3,17-BISTRIMETHYL SILYL ETHERS

John C. Babcock, and J. Allen Campbell, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 114,621, June 5, 1961, now Patent No. 3,341,557, which is a continuation-in-part of application Ser. No. 69,557, Nov. 6, 1960, now abandoned. This application Sept. 8, 1967, Ser. No. 666,490
Int. Cl. C07c 169/08
U.S. Cl. 424—238 5 Claims

This invention relates to novel steroid compounds and processes for their preparation; more particularly to those compounds embraced by the formula(II)



wherein R is selected from the group consisting of hydrogen the acyl radical of a hydrocarbon carboxylic acid containing from one through twelve carbon atoms, an alkyl radical containing from one through eight carbon atoms, tetrahydrofuranyl, tetrahydropyranyl, 5-substituted tetrahydropyranyl, and a silyl radical of the formula

wherein R_1, R_2 and R_3 are selected from the group consisting of alkyl of one through six carbon atoms and phenyl and R' is selected from the group consisting of hydrogen, the acyl radical of a hydrocarbon carboxylic acid containing from one through twelve carbon atoms, and

wherein R_1, R_2, R_3 have the same meaning as above.

3,626,063

THERAPEUTIC COMPOSITIONS COMPRISING 6-FLUORO-16-METHYL PREDNISOLONE, THE 21 ACYLATES AND SALTS THEREOF

Frank H. Lincoln, Kalamazoo; William P. Schneider, Kalamazoo Township, Kalamazoo County, and George B. Spero, Kalamazoo, all of Mich., assignors to Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of application Ser. No. 753,157, Aug. 4, 1958, now Patent No. 3,499,016. This application Aug. 11, 1959, Ser. No. 832,898. The portion of the term of the patent subsequent to Mar. 3, 1987, has been disclaimed.

Int. Cl. C07c *169/32*

U.S. Cl. 424—243 **8 Claims**

This invention relates to therapeutic compositions and more particularly to therapeutic compositions comprising a 6α-fluoro-11β,17α,21-trihydroxy, 16α-methyl-1,4-pregnadiene-3,20-dione and 21-acylates and water-soluble salts thereof as an essential active ingredient in combination with a pharmaceutical vehicle.

3,626,064

TREATMENT OF HYPERURICEMA WITH 4-AMINO-6-HYDROXY-1-H-PYRAZOLO(3,4-D)PYRIMIDINE

George H. Hitchings, Yonkers, and Elvira A. Falco, New Rochelle, both of N.Y., assignors to Burroughs Wellcome & Co. (U.S.A.) Inc., Tuckahoe, N.Y.

Continuation-in-part of application Ser. No. 574,576, Mar. 29, 1956, now abandoned , Continuation-in-part of application Ser. No. 22,394, Apr. 15, 1960, now abandoned , Continuation-in-part of application Ser. No. 221,357, Sept. 4, 1962, now abandoned , Continuation-in-part of application Ser. No. 524,873, Feb. 3, 1966, now abandoned. This application Apr. 25, 1967, Ser. No. 633,399

Claims priority, application Great Britain, Aug. 10, 1955, May 23, 1962, Aug. 23, 1962, 23055/55; 19863/62; 32519/62

Int. Cl. A61k *27/00*

U.S. Cl. 424—251 **2 Claims**

The method of treatment and prophylaxis for hyperuricemia, which comprises administering to a mammal a therapeutically effective amount of a compound 4-amino-6-hydroxy-1-H-pyrazolo(3,4-d)pyrimidine.

3,626,065

STABLE AQUEOUS MULTIVITAMIN PREPARATIONS

Hideyuki Maekawa, Osaka-shi, and Shohei Egawa, Amagasaki-shi, both of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

Filed May 24, 1968, Ser. No. 731,978

Claims priority, application Japan, May 25, 1967, 42/33243

Int. Cl. A61k *15/00*

U.S. Cl. 424—255 **2 Claims**

This invention relates to stable aqueous multivitamin preparations in which the vitamin A ingredient is isolated together with the vitamin C and nicotinamide ingredients from other ingredients including the vitamin B_1 ingredient.

3,626,066

ARYLPYRIDINYL-ALKYL ALCOHOL DERIVATIVES IN COMPOSITIONS AND METHODS FOR TRANQUILIZING MAMMALS

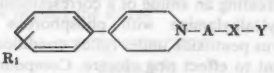
Grover Cleveland Helsley, Richmond, Va., assignor to A. H. Robins Company, Incorporated, Richmond, Va.

Original application Dec. 13, 1967, Ser. No. 690,097, now Patent No. 3,523,950. Divided and this application Jan. 19, 1970, Ser. No. 4,092

Int. Cl. A61v *27/00*

U.S. Cl. 424—263 **9 Claims**

There are disclosed compositions of matter classified in the art of chemistry as derivatives of arylpyridinyl-alkyl alcohols as well as processes for making and using such compositions. The novel chemical compounds are represented by the following formula:



wherein R' represents hydrogen, lower alkyl, lower alkoxy or trifluoromethyl; A represents alkylene having two to four carbon atoms; X represents —O—C(o)—; Y represents phenyl, trifluoromethylphenyl, lower-alkoxyphenyl, and NHR^2 wherein R^2 represents hydrogen, lower alkyl, phenyl, trifluoromethylphenyl and lower-alkoxyphenyl.

The pharmaceutically acceptable acid addition salts of the arylpyridinyl-alkyl alcohol derivatives embraced by the above formula are also included within the scope of this invention.

3,626,067

SUBSTITUTED OXAZOLINES, USEFUL AS PHARMACEUTICALS

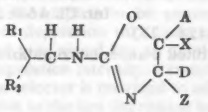
John Harvey, Jr., Wilmington, Del., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed July 1, 1965, Ser. No. 468,999

Int. Cl. A61k *27/00;* **C07d** *85/00*

U.S. Cl. 424—272 **15 Claims**

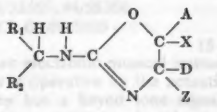
1. A compound of the formula



wherein

R_1 is phenyl, 2-thienyl, 3-thienyl, 2-furanyl or 3-furanyl; R_2 is methyl, ethyl, or cyclopropyl; A, X, D and Z are each separately hydrogen or alkyl of one through four carbon atoms with the limitation that the total number of carbon atoms added together in A, X, D and Z is less than nine.

14. A pharmaceutical composition containing an inert pharmacological diluent and a pharmacologically active amount of a compound of the formula



R_1 is phenyl, 2-thienyl, 3-thienyl, 2-furanyl or 3-furanyl; R_2 is methyl, ethyl, or cyclopropyl; A, X, D and Z are each separately hydrogen or alkyl of one through four carbon atoms with the limitation that the total number of carbon atoms added together in A, X, D and Z is less than nine.

3,626,068

DERIVATIVES OF 3,4-DIHYDROBENZOTHIENO [2,3-C]PYRIDINE AND 3,4-DIHYDRO-5H-BENZOTHIENO[2,3-C]AZEPINE IN PHARMACEUTICAL COMPOSITIONS TO ENDUCE CENTRAL NERVOUS SYSTEM DEPRESSION

John T. Suh, Mequon, Wis., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of application Ser. No. 621,421, Mar. 8, 1967, now abandoned. This application Mar. 5, 1968, Ser. No. 710,633

Int. Cl. A61k *27/00*

U.S. Cl. 424—263 4 Claims

The compounds are 1-substituted-3,4-dihydrobenzothieno[2,3-C]pyridines and 1-substituted-3,4,dihydri-5H-benzothieno[2,3-C]azepines which in the form of pharmaceutical compositions are useful as antihypertensive and antipsychotic agents. They are preferably prepared by treating an amide of a corresponding β-/or γ-(3-thianaphthenyl)alkylamine with phosphorous oxychloride and phosphorus pentoxide under reflux conditions in an inert organic solvent to effect ring closure. Compounds disclosed include 1-propyl-3,4-dihydrobenzothieno[2,3-C]pyridine and 1-phenyl-3,4-dihydro-5H-benzothienoi[2,3-C]azepine.

3,626,069

GROWTH PROMOTION

Walther H. Ott, Westfield, and George Olson, Fanwood, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of application Ser. No. 768,885, Oct. 18, 1968, now abandoned. This application Dec. 30, 1970, Ser. No. 102,970

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 4 Claims

Growth promotion in animals is achieved by administration of 1-methyl-5-nitroimidazol-2-methyl carbamate in feed and/or water.

3,626,070

SUBSTITUTED 2-AMINOBENZIMIDAZOLES AS ANTHELMINTICS

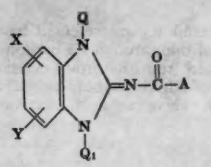
Edward John Soboczenski, Chadds Ford, Pa., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 20, 1968, Ser. No. 714,440

Int. Cl. A61k *27/00*

U.S. Cl. 424—273 6 Claims

Substituted 2-aminobenzimidazoles of the general formula:



where X, Y, A, Q_1 and Q are as defined hereinafter; are useful as anthelmintics. Q_1 includes groups such as carbamoyl and perhaloalkylmercapto while Q includes such groups as hydrogen, carbamoyl, acyl, perhaloalkylmercapto, methyl, and an exemplary species of the general class is the compound:

methyl 1-(butylcarbamoyl)-2-benzimidazolecarbamate.

3,626,071

COMPOSITIONS AND METHODS FOR REDUCING CHOLESTEROL IN THE BLOOD

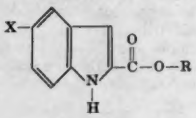
Takashi Kariya; Alfred Richardson, Jr., and Johann Martin Grisar, all of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., New York, N.Y.

Filed Mar. 8, 1968, Ser. No. 711,491

Int. Cl. A61k *27/00*

U.S. Cl. 424—274 9 Claims

Pharmaceutical compositions and methods for reducing the concentration of cholesterol in the blood with an indole derivative of the formula:



wherein X is a halogen and R is hydrogen or lower alkyl; and pharmaceutically acceptable salts of the above indole carboxylic acids with organic or inorganic bases. Illustrative of a compound of the above formula is: 5-chloroindole-2-carboxylic acid.

3,626,072

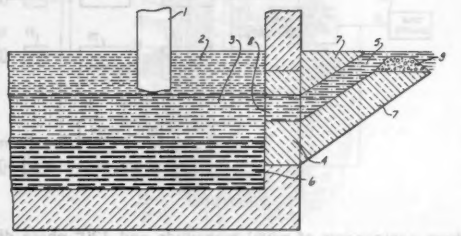
METHOD AND A DEVICE FOR CONTINUOUS SLAGGING OF ELECTRIC AND REVERBERATORY FURNACES, OPERATING WITH A DEEP SLAG BASIN

Georgi Alexandrov Haralampiev; Nicola Pentchev Shopov; Ivan Dimitrov Entchev; Kiril Metodiev Balevski, and Bolyarka Stefanova Balkandjieva, all of Plovdiv, Bulgaria, assignors to Nautchno-Izsledovatelski Institut PO Tzvetna Metalurgia, Plovdiv, Bulgaria

Continuation-in-part of application Ser. No. 708,247, Feb. 26, 1968, now abandoned. This application Apr. 1, 1970, Ser. No. 24,570. Claims priority, application Bulgaria, Feb. 27, 1967, I-261

Int. Cl. F27d *3/15*

U.S. Cl. 13—9 8 Claims



A method and a device for continuously removing slag from electric and reverberatory furnaces having deep slag basins, which are used for melting ores, concentrates, roasting residues and agglomerates of nonferrous metals. An inclined channel passes through the furnace wall, and the lower end of the channel is located inside the furnace at the depth of the quiet slag layer, while the outer outgoing end is at the level of the slag surface inside the furnace and is located on the outer side of the furnace. The slag is removed from the slag basin through this channel, running off through it with a velocity of flow lower than 10 cm./sec. The runoff of the slag from the depth of the quiet layer, combined with the low velocity of outflow through the inclined channel and the slow motion of the slag upwards—in a direction opposite the action of the sedimentation forces of gravity, provides a reduction of the loss of metal with the slags. The constant level of the slag inside the furnace stabilizes the thermal conditions of the furnace. The low velocity of flow of the slag through the inclined channel and the invariable thermal loading of the refractories reduces the wear of the latter.

3,626,073

MEANS FOR HEATING AND TREATING MOLTEN METAL UNDER VACUUM

Gunther Sindelar, Dusseldorf; Edgar Steier, Mulheim-Ruhr, and Horst Stockman, Bredenscheid-Stuter, all of Germany, assignors to Friedrich Kocks

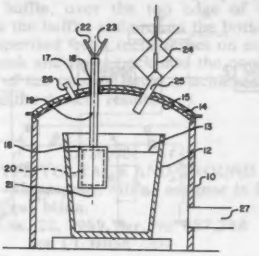
Filed May 20, 1970, Ser. No. 39,071

Claims priority, application Germany, May 22, 1969, P 19 26 290.9

Int. Cl. F27d *3/00, 3/10*

U.S. Cl. 13—31 7 Claims

An apparatus is provided for heating and treating molten metals under vacuum which includes a container for a charge of molten metal, a cover removably sealing said container, at least one rotatable heated stirrer journaled in said cover and extending into said container, means for rotating said stirrer and means for heating the stirrer.



3,626,074

TOUCH-RESPONSIVE TONE ENVELOPE CONTROL CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS

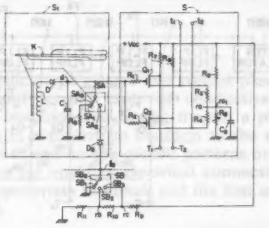
Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed June 16, 1970, Ser. No. 46,682

Claims priority, application Japan, June 24, 1969, June 24, 1969, June 24, 1969; 44/49952, 44/49953, 44/49954

Int. Cl. G10h *1/00*

U.S. Cl. 84—1.01 10 Claims



In a keying system for an electronic musical instrument in which an individual keyer is adapted to be controlled in response to the intensity of depression of a corresponding playing key so that a keyed tone signal has an amplitude in accordance with the key depression intensity, a common DC supply means with a voltage selector is provided to additively control the keyer irresponsive to the key depression intensity. The voltage selector determines which one of said two controls should prevail. The system is simple in construction and operation and inexpensive and easy to manufacture as well as provides a variety of excellent tonal effects.

3,626,075

TOUCH-RESPONSIVE TONE ENVELOPE CONTROL CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENTS

Ryu Hiyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed July 8, 1970, Ser. No. 53,218

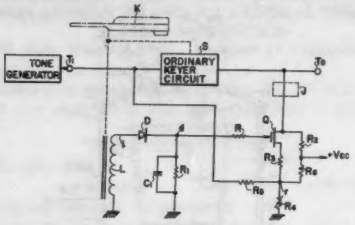
Claims priority, application Japan, July 12, 1969, July 12, 1969; 44/55355, 44/55356

Int. Cl. G10h *3/00*

U.S. Cl. 84—1.13 15 Claims

In a keying system for an electronic musical instrument in which an individual keyer is operative by the actuation of a corresponding playing key but a keyed tone signal has a predetermined amplitude irresponsive to a key depression intensity, there is provided in combination with the keyer a corresponding circuit means producing a tone signal of an envelope pattern or abrupt buildup and subsequent decay, a

so-called attack signal, in response to the key depression intensity. The touch-responsive attack signal gives forth an ef-



fective touchnresponsive auditory sensation of the total sound.

3,626,076

MIXER CIRCUIT FOR ELECTRONIC MUSICAL INSTRUMENT PROVIDING STAIRCASE TONE SIGNAL

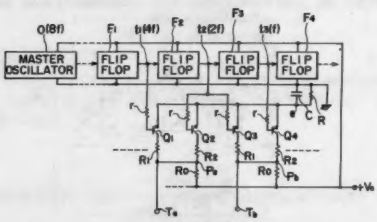
Yasuji Uchiyama, Hamakita, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed May 19, 1970, Ser. No. 38,795

Claims priority, application Japan, May 21, 1969, May 21, 1969; 44/39379, 44/39380

Int. Cl. G10h *5/06*

U.S. Cl. 84—1.23 **7 Claims**



Disclosed is a tone generator circuit for use in an electronic musical instrument, in which respective output terminals of a plurality of cascaded flip-flop circuits are connected to control electrodes of active elements such as transistors, said active elements are adapted to effect a switching action with their predetermined on-state resistances in response to magnitudes of signal potentials applied to the control electrodes from the outputs of the flip-flop circuits, other electrodes of the elements are connected as groups at common connection points at each of which a load means is connected, and in each said group of the active elements, a signal is derived across the load means in the form of summed potentials from the commonly connected other electrodes, whereby tone signals each having a sawtooth-approximating staircase wave and a different fundamental frequency are provided. The tone generator circuit minimizes the use of passive elements such as capacitors and resistors, etc. and thus allows it to be constituted only by active elements without using many passive elements and therefore, an integration of the circuit is facilitated. Further, said active elements function to reduce the loads of said flip-flop stages and provide buffer effects between said stages, to insure reliability in the operations of the tone generator circuit.

3,626,077

ORGAN TONE MODULATION SYSTEM

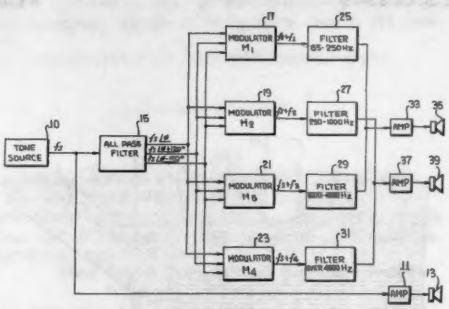
Walter Munch, Jr.; William S. Wagner, and Dale M. Huetrecht, all of c/o D. H. Baldwin Co., 1801 Gilbert Ave., Cincinnati, Ohio

Filed May 26, 1970, Ser. No. 40,536

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **7 Claims**

Organ output, comprising a band of audio frequencies, is divided into four frequency subbands, each of which is shifted in frequency by one of four respective diverse increments. The first and third subbands are acoustically transduced and radiated via a rotary loudspeaker and the second and fourth subbands via a stationary loudspeaker. These radiations are acoustically mixed with the radiated unmodified organ output to produce desired tonal effects. Frequency shifting of the subbands can be inhibited at will, means being provided automatically to maintain the acoustic signal level the same whether or not frequency shifting is in force, for a given setting of the expression pedal. Each of the four subbands can be shifted by either of two respective frequency increments, or inhibited, to permit selective variation of the overall acoustic effect. Frequency shifting for each subband is achieved by dividing the organ tone into



three components of equal magnitude and 120° phase difference. To obtain the 120° spaced components, the input tone signal is applied to two-phase shift filters which provide two of the components, the third component being derived by summing the first two components and inverting the resulting signal. Each component is applied to a respective section of four three-section modulators, each section comprising a transistor pair connected to form a DC differential amplifier with one input at AC ground. The emitter currents of each transistor pair are varied at the shift frequency by a three-phase oscillator, each modulator section being controlled by a respective oscillator phase. The outputs of each section of the modulator are combined to cancel the oscillator components provided at each section.

3,626,078

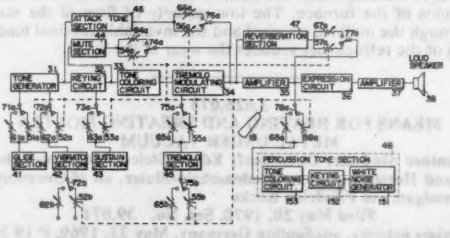
COMBINATION OF MUSICAL EFFECT SYSTEM AND KNEE CONTROL

Tomoaki Sekiguchi, Hamamatsu-shi, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu-shi, Japan

Filed Sept. 3, 1968, Ser. No. 757,082

Int. Cl. G10h *1/02*

U.S. Cl. 84—1.24 **4 Claims**



A musical effect system for an electric organ using knee control. A tone generator circuit for generating a tone signal having a frequency according to the selective operation of a plurality of keys is connected with other circuits for attaining special musical effects. Associated with these circuits are variable resistors for simultaneously and continuously varying the individual factors producing such musical effects. The variable resistors interlock with a knee-operated lever so as to effect continuous variations in accordance with the mag-

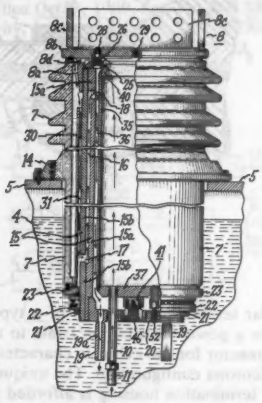
nitude of the displacement of the knee-operated lever. Selector switches are provided to determine which of such musical effects are rendered operative in connection with the knee-operated lever.

3,626,079

ELECTRICAL BUSHING WITH COOLING MEANS

William A. Keen, Jr., Cheshire, and Joseph F. Lynch, Pittsfield, both of Mass., assignors to General Electric Company

Filed Aug. 10, 1970, Ser. No. 62,284
Int. Cl. H01b *17/54, 17/26*
U.S. Cl. 174—15 BH 10 Claims



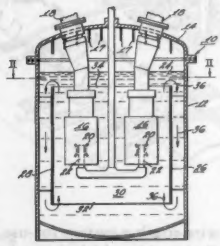
Electrical insulating oil-cooled bushing for transformers and the like. The inner tubular current-carrying conductor of the bushing is formed of a pair of concentric tubes forming an annular cooling duct therebetween with inlet and outlet apertures at opposite ends. Baffle tubes are arranged on opposite sides of the composite conductor to form two additional cooling fluid ducts so that cooling fluid introduced under pressure into the bushing is directed in three passes along the surfaces of the composite conductor. Cooling fluid leaving the interior of the bushing passes through apertured terminal blades for cooling the latter.

3,626,080

MEANS FOR CIRCULATING LIQUID COOLANTS

Ronald A. Pierce, West Allis, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Dec. 10, 1969, Ser. No. 883,971
Int. Cl. H01b *7/34*
U.S. Cl. 174—15 R 9 Claims



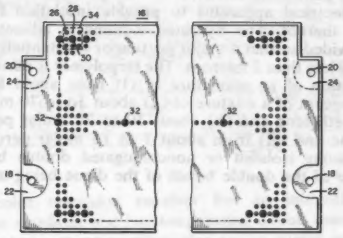
An electric circuit interrupter comprises a tank in which arc-interrupting devices are located. The tank contains a cooling liquid comprising oil and liquid freon in which the devices are submerged. A tubular baffle completely submerged in the cooling liquid and spaced from the tank wall surrounds the devices. Heat generated by current flow through the devices causes heating of the cooling liquid and vaporization and bubbling of some of the liquid freon within the baffle. This, in turn, causes the cooling liquid to flow upward inside the baffle, over the top edge of the baffle, downward outside the baffle, and around the bottom edge of the baffle. The vaporized freon recondenses on exposed surfaces inside the tank and flows back into the cooling liquid. Thus, circulation of the cooling liquid is achieved and more efficient cooling of the devices results.

3,626,081

SANDWICH-TYPE VOLTAGE AND GROUND PLANE

Richard L. Little, Minneapolis, Minn., assignor to Comcet Incorporated, St. Paul, Minn.

Filed Dec. 22, 1969, Ser. No. 887,208
Int. Cl. H05k *1/04*
U.S. Cl. 174—68.5 12 Claims



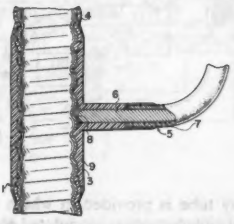
A unitary sandwich-type ground and voltage plane consisting of a first and second layer of conductive material separated by an insulator and having therein a plurality of spaced apertures in a pattern to conform to the spacing of connector terminals and having etched patterns on said first and second layers for enabling electrical connections to be made between appropriate terminals and the first and second conductive layers.

3,626,082

CORRUGATED PIPE BUSLINE

Kenji Kasai, Tokyo; Nobunori Kuroki, Saitama-ken; Takaji Takei, and Sigeru Kanda, both of Kanagawa-ken, all of Japan, assignors to Furukawa Denki Kogyo Kabushiki Kaisha, Tokyo and Kajima Corporation, Tokyo, Japan

Filed May 2, 1969, Ser. No. 830,906
Claims priority, application Japan, May 30, 1968, Nov. 25, 1968, Dec. 18, 1968; 43/44439, 43/102115, 43/92327
Int. Cl. H02g *3/00, 1/00*
U.S. Cl. 174—72 R 5 Claims



A long corrugated pipe bus conductor to be laid vertically in a high-storied building has the conductors of branching lines bonded thereto at predetermined intervals. The interval

may be so selected as to correspond to the height of one story of the building. Each of the branching lines leads to an electrical equipment such as a switchboard on each story.

3,626,083

HIGH-VOLTAGE INSULATION AND INSULATED HIGH-VOLTAGE APPARATUS

Herbert F. Minter, Pittsburgh; Richard D. Buckley, Stoneboro, and Martin P. Seidel, Sharon, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation-in-part of application Ser. No. 355,382, Mar. 27, 1964, now abandoned. This application Jan. 12, 1968, Ser. No. 724,646

Int. Cl. H01b *3/02*

An admixture of (1) from 55 to 70 percent by weight of hydrated alumina and (2) from 30 to 45 percent by weight of a petroleum oil extended ethylene-propylene-diene terpolymer, containing from 20 to 100 phr. of oil, is molded about electrical apparatus to provide insulation for components thereof. The hydrated alumina is advantageously finely divided so that a major portion or substantially all particles are less than 2 microns. The terpolymer is derived from the reaction of an admixture of (I) from about 85 to 99 molar percent of a mixture of (a) about 3o to 70 molar percent of ethylene and (b) about 30 to 70 molar percent of propylene and (II) from about 1 to 15 molar percent of a diene having isolated or nonconjugated double bonds, at least one of the double bonds of the diene being terminally located.

3,626,084

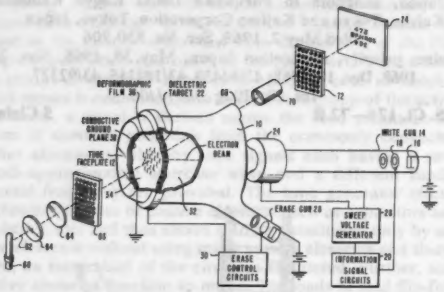
DEFORMOGRAPHIC STORAGE DISPLAY TUBE

Robert J. Wohl, San Jose; Frank A. Hawn, Los Gatos, and Harold C. Medley, Los Gatos, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 683,292, Nov. 15, 1967, now abandoned. This application June 12, 1970, Ser. No. 48,862

Int. Cl. H04n *5/74*

U.S. Cl. 178—7.5 D **17 Claims**



A display tube is provided in which a dielectric target is charged by an information modulated electron beam, and the resulting electrostatic field between the target and a conductive ground plane deforms a dielectric film. The film is located in a separate chamber of the tube at the side of the target opposite the electron beam generating equipment. The film deformations behave as point light valves, and a visible image of the information contained therein is provided by transmissive or reflective optical systems.

3,626,085

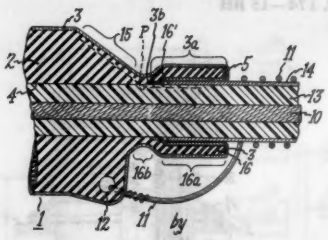
CABLE TERMINATION HOUSING HAVING MEANS FOR PREVENTING CORONA AND UNIFORMLY GRADING VOLTAGE

Richard H. Arndt, Lenox, and Henry N. Tachick, Pittsfield, both of Mass., assignors to General Electric Company

Filed Apr. 13, 1970, Ser. No. 27,497

Int. Cl. H02g *15/02*

U.S. Cl. 174—73 R **10 Claims**



A modular termination housing, of a type adapted to be slipped onto a power distribution cable to afford a voltage-grading connector for the cable, is characterized by having a unique anticorona configuration. The unique anticorona feature of the termination housing is afforded by providing the housing with a flexible sealing means that assures continuous, uniform contact between a conductive coating on the outer surface of the housing and a conductive coating of a cable on which the housing is mounted.

3,626,086

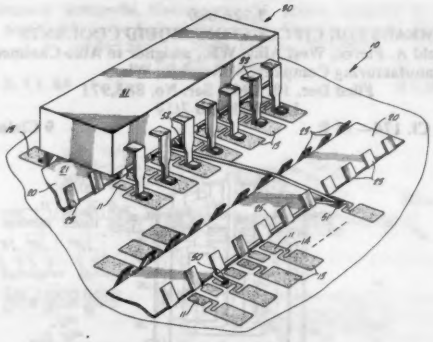
WIRE-ROUTING SYSTEM

Ulyss Ray Rubey, Denton, Tex., assignor to Computer Industries, Inc., Sherman Oaks, Calif.

Filed Apr. 28, 1970, Ser. No. 32,576

Int. Cl. H05k *1/18*

U.S. Cl. 174—68.5 **8 Claims**



An improved wire-routing system for use with reflow wiring machines is disclosed in which the system includes a single-sided printed circuit board having a plurality of wire land pads and integrated circuit land pads located thereon. Wire routing fixtures are also adapted to be positioned on the circuit board; each fixture having a plurality of longitudinally spaced guides positioned near adjacent land pads for receiving portions of the insulated wire as it is strung or routed from one wire land pad to another. Each of the guides ex-

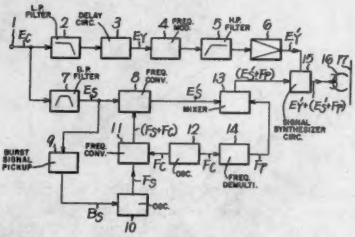
tends upwardly on a slant to enable the wire to be directed downwardly flush with the base of the fixture when routed thereby so as not to interfere with subsequent wiring in that area. Power busses are also provided for connection to any desired integrated circuit land pad. The power busses are formed as flat strips and are positioned beneath the fixtures in such a manner that they also do not interfere with the wire-routing operation.

3,626,087

MAGNETIC RECORDING AND REPRODUCING DEVICE FOR COLOR VIDEO SIGNALS

Masao Tomioka, Urawa-shi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Oct. 7, 1969, Ser. No. 864,330
Claims priority, application Japan, Oct. 7, 1968, 43/72977
Int. Cl. H04n 5/78, 7/12, 9/44
U.S. Cl. 178—5.4 CD 6 Claims



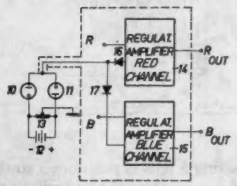
A magnetic-recording device for video signals has means for discriminating between a composite color video signal and a monochrome video signal and means for driving an oscillator which generates a pilot signal of a chrominance signal only when a composite color video signal is being recorded so that no pilot signal is recorded to interfere with the reproduction of a monochrome video signal.

3,626,088

REGULATING ARRANGEMENT FOR COLOR CAMERAS

Hans-Dieter Schneider, Gross-Gerau am Bruckelchen, Germany, assignor to Fernseh GmbH, Darmstadt, Germany

Filed July 10, 1969, Ser. No. 840,673
Claims priority, application Germany, July 11, 1968, P 17 62 576.2
Int. Cl. H04m 9/04
U.S. Cl. 178—5.4 R 12 Claims



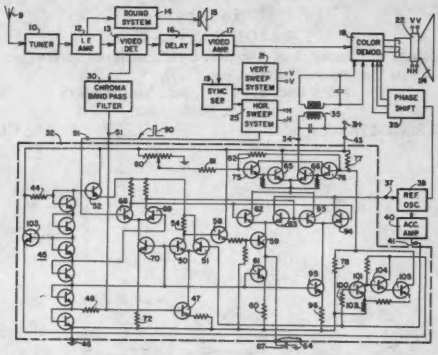
A regulating arrangement for use in color cameras in which the individual chrominance channels are provided with amplifiers. Photoelectric cells emit signals as a function of the color temperature of the light impinging upon the cells. The amplification balance of the chrominance channels is adjusted as a function of the signals provided by the photoelectric cells, so that the amplifiers in the individual chrominance channels are adapted to the color temperature of the prevailing lighting conditions.

3,626,089

CHROMA SIGNAL PROCESSING CIRCUIT FOR A COLOR TELEVISION RECEIVER

Gildo Cecchin, Niles, and Francis H. Hilbert, River Grove, both of Ill., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Nov. 26, 1969, Ser. No. 880,059
Int. Cl. H04n 9/48
U.S. Cl. 178—5.4 AC 13 Claims



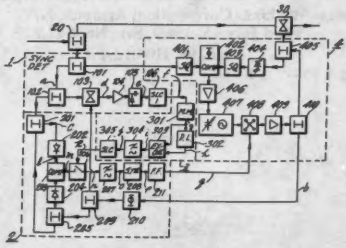
A color television receiver has an integrated circuit chroma amplifier and burst-separating circuit using a pair of differential current-steering gates as the output and separating stage thereof with switching of the steering gates being utilized to gate the chroma signals to a chroma output during the scan portions of the cycle of operation of the receiver, and to gate the burst signals to an output coupled to a reference oscillator, with a substitution of a corresponding DC operating level being provided at each of these outputs when the signal is being switched to the other output. In addition, the chroma amplifier DC operating point is determined by a constant current source which is immune to variations in the DC level of the signals caused by variations in the ACC gain control signal.

3,626,090

AUTOMATIC PHASE CONTROL SYSTEM FOR USE IN SUPPRESSED CARRIER TELEVISION TRANSMISSION

Susumu Akiyama, and Mitsuaki Naganuma, both of Toyko, Japan, assignors to Nippon Electric Company, Limited, Tokyo, Japan

Filed Mar. 2, 1970, Ser. No. 15,333
Int. Cl. H04n 5/44; H04b 1/16
U.S. Cl. 178—7.3 R 3 Claims



An automatic phase control system specially adapted for use in receiving and demodulating television signals which are transmitted with the carrier effectively suppressed. The automatic phase control system includes a carrier wave generator whose phase is either maintained or reversed by 180°. The need for phase reversal is determined by combining the received television signal with the synchronized carrier and performing amplitude comparison between the su-

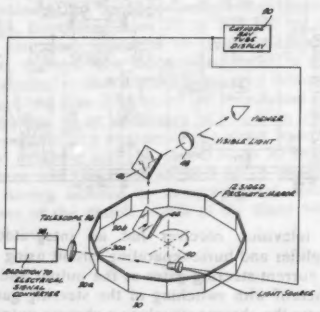
perimposed signals and the synchronized carrier to generate an output control signal whenever the amplitude of the superimposed signals is lower than the amplitude of the synchronized carrier wave. This control signal is passed only during the vertical blanking period, and is applied to a phase reversal circuit coupled to the output of the synchronizing carrier wave generator so that the appropriate in-phase carrier will be used to demodulate the carrier suppressed television signal.

3,626,091

IMAGE CONVERTER

Robert P. Casper, Los Angeles, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Dec. 11, 1969, Ser. No. 884,088
Int. Cl. H04n *3/08*
U.S. Cl. 178—7.6 **16 Claims**



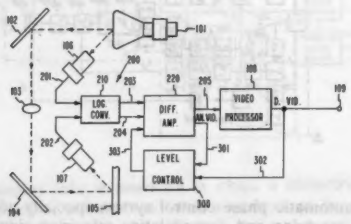
Real time raster scanning of a field is provided by rotating an N-sided prismatic mirror about its axis of symmetry. N may be any integer equal to or greater than two. Mirror faces on the prism are aligned with respect to the axis of rotation such that each face deviates the look angle of a detector by an amount equal to one resolution element (for contiguous scan lines). Rotation about the axis of symmetry produces a scan pattern similar to that of a TV system. The scan pattern is reconstructed by converting the output of the detector, into modulated light which is directed upon a rotating N-sided prismatic mirror with the restriction that the mirror face upon which the light is directed has the identical angle with respect to the axis of rotation as the mirror face which the detector sees at that time.

3,626,092

VIDEO AMPLIFIER FOR OPTICAL SCANNERS

Melvin G. Wilson, Rochester, Minn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1969, Ser. No. 841,823
Int. Cl. H04n *5/38*
U.S. Cl. 178—7.1 R **19 Claims**



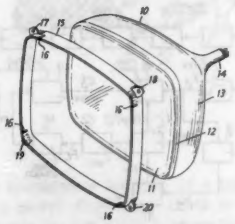
To correct for intensity variations in an optical scan generator, a first photodetector receives a light input directly from the generator, while a second photodetector receives light reflected from a document. A converter produces logarithmic representations of both photodetector outputs, and feeds them to a differential amplifier for subtraction. A video processor then produces a digitized video signal from the amplifier output. A low-frequency level control feeds the amplifier output back to its input to provide drift compensation by referencing the average background to a specified output level. The level control may be disabled by certain values of the digitized video signal.

3,626,093

IMPLOSION-RESISTANT CATHODE-RAY TUBES

James Inglis, London, England, assignor to Thorn Radio Valves and Tubes Limited, London, England

Filed Sept. 10, 1970, Ser. No. 71,077
Claims priority, application Great Britain, Oct. 15, 1969, 50762/69
Int. Cl. H01j *29/02*
U.S. Cl. 178—7.8 **6 Claims**



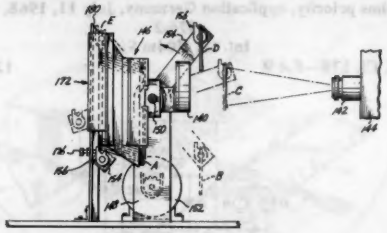
An implosion-resistant cathode-ray tube includes a metal frame encircling the flange of the face plate and a tension band encircling the frame, in which a plurality of spaced-apart slots are formed in the front portion of the frame with one end of each slot opening at the front edge of the frame.

3,626,094

MESSAGE DISPLAY SYSTEM FOR TELEVISION

Milton K. Widdekind, Seattle, and William A. Lee, Puyallup, both of Wash., assignors to Electronic Systems Development, Inc., Seattle, Wash.

Filed Jan. 8, 1969, Ser. No. 789,740
Int. Cl. H04n *5/24*
U.S. Cl. 178—7.88 **6 Claims**



A camera having a lens is positioned so that the lens has a predetermined line of view. An indexing unit is located at a position remote from said camera and selectively positions a plurality of cards into a position in which the cards on their images are viewable by the lens. Each card bears a written message. A clock or other viewable object is located remote from said indexing unit and is positioned so that it or its image may be viewed by said lens. In the preferred form the image from the cards or the clock is selectively positioned in the line of view of the lens by the selective rotation of a mirror. In modified forms the clock is directly in the lens line of view and the cards are selectively positioned into the lens line of view between the clock and the lens. In one modified form the cards are carried in an arcuate path about a horizontal axis whereas in the other modified form the cards

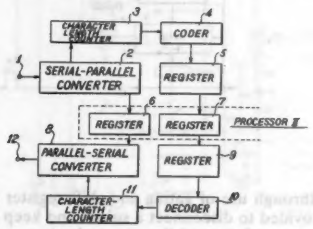
are carried about a vertical axis. A control unit includes a system of various length tabs on the cards for breaking a light beam to one of three photocells. The tab length determines the length of time that a card is viewed and whether or not the mirror is rotated.

3,626,095

REGENERATING REPEATING SYSTEM FOR START-STOP TELEGRAPH SIGNALS

Yukio Nakagome, and Yasuo Fukata, both of Tokyo-to, Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo-to, Japan

Filed May 15, 1969, Ser. No. 824,908
Claims priority, application Japan, May 18, 1968, 43/33398
Int. Cl. H04l *25/52*
U.S. Cl. 178—70 R **3 Claims**



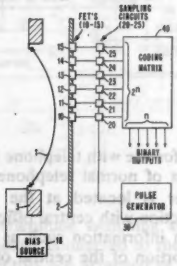
Disclosed herein is a regenerative repeating system for start-stop serial telegraph signals of a plurality of channels by the use of a time-divisional serial-parallel signal converter and a time-divisional parallel-serial converter connected to the serial-parallel converter through a data processor, in which control information is transferred from the serial-parallel converter to the parallel-serial converter to determine timerdivisionally durations of stop elements of the start-stop telegraph signals so that the duration of each stop element is equal to one of a plurality of predetermined durations which correspond respectively to divided *n* parts of the remainder of the regular duration of the stop element except a minimum duration determined so as to secure normal reception of the stop element, where *n* is a positive integer.

3,626,096

MICROPHONE FOR DIGITAL SPEECH TRANSMISSION

Waldemar Kurt von Muench, Aachen, Germany, and Ernst H. Rothauser, 8832 Wollerau, Schwyz, Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1969, Ser. No. 801,384
Int. Cl. H04r *23/00*
U.S. Cl. 179—1 R **13 Claims**



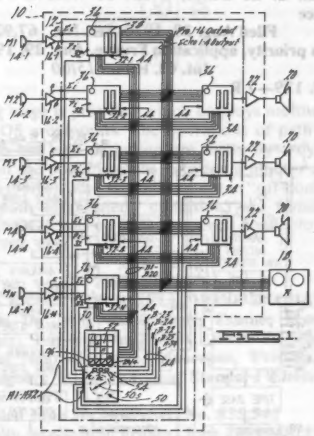
An arrangement for transforming mechanical or acoustical waves into digital electrical signals is disclosed. The arrangement includes a converter which in principle is a condenser microphone having a diaphragm which is flexible and electrically biased. Also included is a plurality of switching elements (FET's) disposed in a stiff plate which forms a portion of the condenser microphone and arranged so that they are electrically actuated by the electric field associated with the diaphragm depending on the distance of the diaphragm from an individual switching element. Sampling circuits associated with each of the switching elements apply the outputs of the switching elements to a coding matrix and a binary output representative of the condition of the switching elements at any instant is provided. The arrangement of the switching elements along the radius of the diaphragm and the use of exclusive OR circuits in the sampling circuits are also disclosed.

3,626,097

ACCESSING CONTROLLER FOR MULTIPLE-INPUT PLURAL OUTPUT SIGNAL CONTROL CONSOLE DEVICE

Robert A. Bloom, Oak Park, and Don E. Haddock, Warren, both of Mich., assignors to Audio Designs and Manufacturing, Inc., Roseville, Mich.

Filed Sept. 26, 1969, Ser. No. 861,347
Int. Cl. G09b *5/04*
U.S. Cl. 179—1 B **24 Claims**



An accessing controller for a signal control console device having a multiplicity of signal input channels selectively and variously connectable through said controller to a plurality of signal output channels of the console device and featuring both channel interlocked or cancellation type and channel accumulating or cumulative-type switching units selectively activated from a single keyboard switching unit selector also affording a selection of the activated signal channel or channels of a switching unit selected thereby as well as a selection of any one or more of a plurality of clearing function controls exercised by the controller over the several switching units.

3,626,098

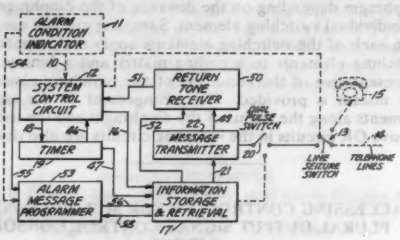
ALARM SYSTEM

John H. Lee, Saint Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Aug. 25, 1969, Ser. No. 852,600
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 R **18 Claims**

A timer is included in an alarm system for enabling termination of message transmission from the alarm system. In an alarm system of the type wherein in response to a sensed alarm condition an information storage and retrieval unit operates a dial pulse switch to dial a telephone number stored in the information storage and retrieval unit and causes a message also stored therein to be repetitively transmitted over telephone lines, the timer is coupled to the information storage and retrieval unit and actuated to operate simultaneously therewith. Upon completion of a predetermined interval, the timer provides a signal to the information

storage and retrieval unit for enabling termination of the message transmission. Transmission is thereafter terminated upon the provision of an end-of-message indication from the information storage and retrieval unit.

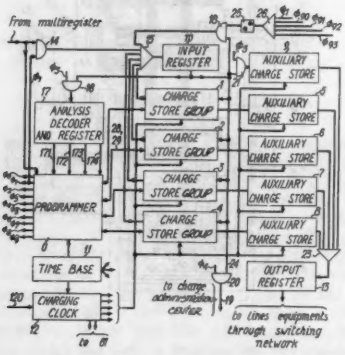


3,626,099

TELEPHONE CHARGING DEVICE

Christian S. Le Bellec, 2 rue de Roud-ar-Roch, Lannion, France

Filed Aug. 28, 1970, Ser. No. 67,925
Claims priority, application France, Aug. 29, 1969, 6929728
Int. Cl. H04m *15/00*
U.S. Cl. 179—7 R **2 Claims**



Charging device associated with a telephone exchange and receiving from the multiregister of the telephone exchange at the beginning of each call a charging word including the address of the caller, the charge rate and the charging mode assigned to the call and, at the end of the call, an end of call word. The charging word is received in an input register, then transferred into one of a plurality of charge circulating stores sequentially looped through a common processor. The processor selectively receives, from a charge clock, bits of predetermined frequency, said frequency depending upon the charge rate written in the charging word and accumulates these bits in the charging word. Means are provided to process differently the calls whose charge is independent of time and the calls involving the transmission of charge signals on the subscriber lines.

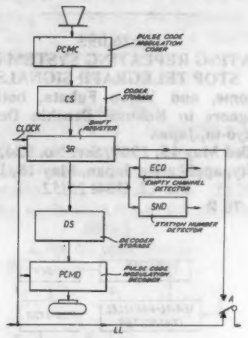
3,626,100

SUBSCRIBER SUBSET FOR A PCM-LOOP SYSTEM

Joseph Hood McNeilly, Harlow Essex, and Roger Alan Manship, Stortford, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 21, 1969, Ser. No. 826,416
Claims priority, application Great Britain, June 21, 1968, 29,773/68
Int. Cl. H04j *3/08*
U.S. Cl. 179—15 AL **7 Claims**

A subset for use in a pulse code modulated telephone system is provided which system employs a transmission loop with subscriber subsets serially inserted into said loop at various points along its length. The subset encodes signals within itself through use of gating and shift register circuits. Means are provided to disconnect a subset and keep the loop closed in the event of power failure in a subset.

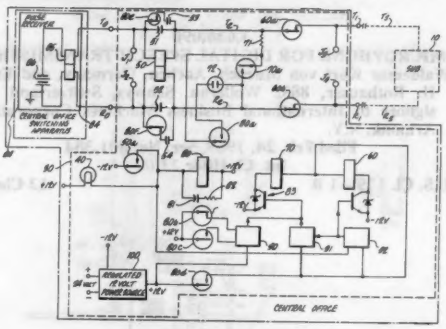


3,626,101

LOOP EXTENDER FOR SUBSCRIBERS CONNECTED TO A CENTRAL OFFICE BY ABNORMALLY LONG TELEPHONE LINES

Alan R. Fitzsimons, Laguna Beach, and Robert John Phelps, Anaheim, both of Calif., assignors to San/Bar Electronics Corporation, Long Beach, Calif.

Filed June 2, 1969, Ser. No. 829,583
Int. Cl. H049 *1/30*
U.S. Cl. 179—16 F **10 Claims**

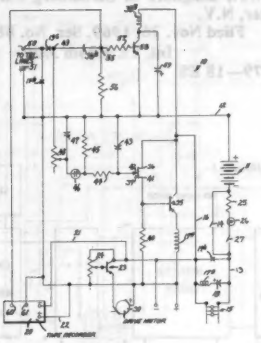


A loop extender for use with telephone lines exhibiting line resistance in excess of normal telephone lines is disclosed. The loop extender is located at the central office and operates in conjunction with central office equipment that is designed to obtain information such as dial pulses from a subscriber. One portion of the central office equipment exhibits a saturated condition in response to a predetermined shunt across the telephone pair. Means are provided in the loop extender for recognizing dial pulses over the telephone lines from the subscriber and responding thereto by alternately open circuiting and shunting the telephone pair whereby the central office equipment obtains the information transmitted form the subscriber.

3,626,102
ELECTRONIC CIRCUITRY FOR A TELEPHONE MONITORED ALARM SYSTEM

Robert J. Cameron, Winnipeg, Manitoba, Canada, assignor to Leonard P. Keg, Winnipeg, Manitoba, Canada, a part interest

Filed Oct. 25, 1968, Ser. No. 770,605
Int. Cl. H04m *11/04*
U.S. Cl. 179—5 P 6 Claims

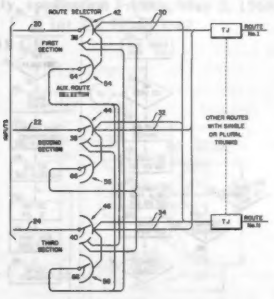


Electronic circuitry including a tape recorder and condition-responsive means, such as burglar alarms, fire alarms, etc., adapted to be connected to telephone lines and a suitable source of power for automatically dialing and providing a voice message at a remote telephone upon the occurrence of a condition and for resetting the system upon receipt of a return call, as well as notifying the caller that the system is reset.

3,626,103
ROUTE SELECTOR ARRANGEMENT WITH ALL-TRUNK AVAILABILITY

Ramses R. Mina, and Gunter F. Neumeier, both of Rochester, N.Y., assignors to Stromberg Carlson Corporation, Rochester, N.Y.

Filed Jan. 16, 1970, Ser. No. 3,496
Int. Cl. H04q *3/06*
U.S. Cl. 179—18 AG 1 Claim

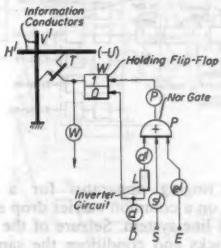


A step-by-step telephone switching system in which the trunks are permanently connected to the outputs of the first selectors. The selectors are arranged in groups with a small number of auxiliary selectors included in each group. The outputs of the auxiliary selectors are connected to the same trunks as are the outputs of the regular first selectors in the respective groups to which they are assigned. Auxiliary outputs on each of the regular first selectors are connected to the inputs of auxiliary selectors in each of the other groups. Each of the inputs has access to all of the trunks of the exchange, and no more than two selectors, one regular and one auxiliary, are used on any call.

3,626,104
SWITCHING STAGE WITH MOS CROSSPOINTS

Marc Jean Pierre Leger, Issy-les-Moulineaux; Claude Paul Henri Lerouge, Maurepas, and Marc Andre Regnier, Aulnay-sous-Bois, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 19, 1969, Ser. No. 834,673
Claims priority, application France, June 25, 1968, 156405
Int. Cl. H04q *3/00*
U.S. Cl. 179—18 FH 6 Claims

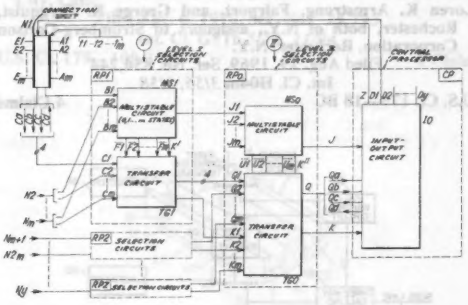


A switching stage is provided which employs multiselectors formed by MOS crosspoints. The operations of path search, subscriber test and call detection are made by a cyclic exploration of all the possible paths between a junctor and one (or all) subscriber(s). The supervision data ("off-hook" condition and "path established" condition) are obtained by monitoring the DC levels on the two speech conductors.

3,626,105
INTERFACE UNIT FOR A TELEPHONE EXCHANGE

Jacques Henri De Jean, Ris-Orangis, Essone; Marc Jean Pierre Leger, Issy-Les-Moulineaux, Hauts-de-Seine, and Claude Paul Henri Lerouge, Maurepas, Yvelines, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed June 23, 1969, Ser. No. 835,541
Claims priority, application France, June 28, 1968, 157201
Int. Cl. H04q *3/54*
U.S. Cl. 179—18 ES 11 Claims



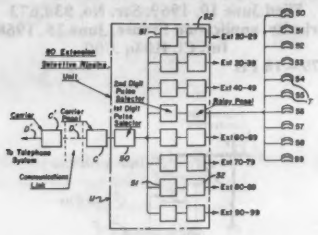
An interface unit is provided for connection between each of a plurality of peripheral devices and a central processing unit. The peripheral devices include such things as subscribers lines, trunks and junctors. The interface unit includes a temporary memory for storing status information or instructions regarding the peripheral devices. A permanent memory delivers regulating signals for scanning current test inputs and comparing them with data stored in the temporary memory. When there is a discrepancy in the data in the memories, the unit calls the central processor and sends its information to the central processor, where it is processed and new data is sent back to the unit.

3,626,106

APPARATUS AND METHOD FOR THE SELECTIVE RINGING OF TELEPHONES

Clarence A. Greening, and Billy G. Grimsley, both of Farmington, N. Mex., assignors to Clarence A. Greening and Billy G. Grimsley, Farmington, N. Mex.

Filed Aug. 27, 1969, Ser. No. 853,307
Int. Cl. H04m *1/26*
U.S. Cl. 179—18 AD **16 Claims**



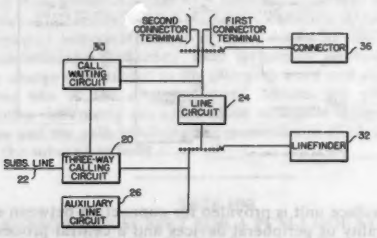
A selective ringing apparatus for a multiextension telephone system on a common carrier drop either as a point to point or a part line system. Seizure of the apparatus by a central control locks and conditions the same to receive a sequence of two dial digit pulse trains for ringing a selected extension. The first pulse train is directed into a selector having a distributor gate for each group of dial pulses which may occur in the first dial digit. The second pulse train is directed into one of a group of selectors, a selector for each distributor gate, and each has a distributor gate for each group of dial pulses which may occur in the second dial digit. Locking circuits select and hold these selectors to permit the ringing apparatus to ring a selected telephone extension. The apparatus can also be locked out if a local telephone seizes the line. Various other features include the use of wire line arrangements to selectively ring remotely located telephone extensions and a complimentary bridging board for use when the extensions are arranged as a party line circuit to permit selective dialing by a local extension to either the remote central control panel or to another extension within the system.

3,626,107

THREE-WAY CALLING AND CALL-WAITING ARRANGEMENTS FOR STEP-BY-STEP TELEPHONE SYSTEMS

Loren K. Armstrong, Fairport, and George R. Bergquist, Rochester, both of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Aug. 29, 1969, Ser. No. 854,244
Int. Cl. H04m *3/56, 3/58*
U.S. Cl. 179—18 BC **4 Claims**



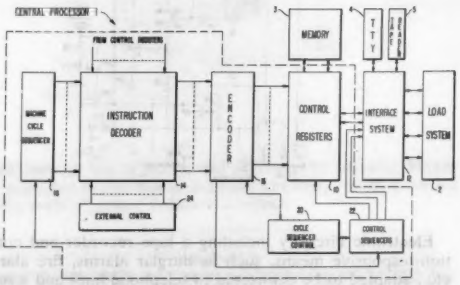
Relay trees providing call-waiting and three-way calling services in step-by-step telephone switching systems, including interlock connections to insure unambiguous operation. The subscriber's line makes two appearances in the linefinder and connector banks of the exchange, and is also connected to an auxiliary line circuit. The call-waiting and three-way calling circuits are individually assigned to the respective lines subscribing for them. Taken together, the circuits provide service substantially equivalent, and in respect of the conference capability, superior to a key-set telephone with two lines to the exchange and bidirectional trunk hunting.

3,626,108

SYSTEM AND PROCESS FOR CONTROLLING AN AUTOMATIC TELEPHONE EXCHANGE

William A. Oswald; Lloyd H. Yost, both of Rochester; Frank Y. Shaw, Honeoye Falls, and William F. Bartlett, Rochester, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,102
Int. Cl. H04m *3/00*
U.S. Cl. 179—18 ES **22 Claims**



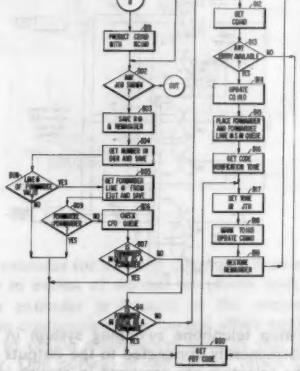
System and process for controlling an automatic telephone exchange to effect line/trunk scan, loop analysis and connection between the available networks in response thereto.

3,626,109

CALL-FORWARDING PROCESS

William F. Bartlett, East Rochester; William A. Oswald, and Frank Y. Shaw, both of Rochester, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,157
Int. Cl. H04m *3/54*
U.S. Cl. 179—18 BE **19 Claims**



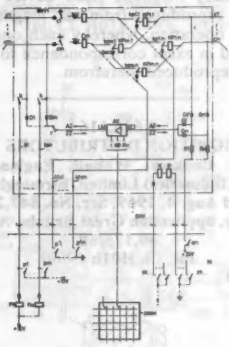
Call-forwarding process for use with automatic telephone systems wherein a call originally directed to one subscriber is transferred to a second subscriber except for calls from the second subscriber to the one subscriber.

3,626,110

GUIDE WIRE NETWORK WITH ONE AUXILIARY WIRE

Heinrich Halfmann, Korntal, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Dec. 10, 1969, Ser. No. 883,908
Claims priority, application Germany, Dec. 18, 1968, P 18 15 435.3
Int. Cl. H04q 3/42
U.S. Cl. 179—18 GE 6 Claims



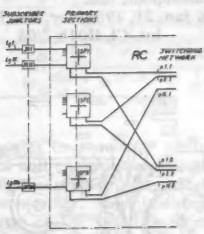
A multistage cross-point network which uses at least one link between each stage. Each such link has a guide wire over which available path testing takes place. At each stage, the guide wires are connected to a signal amplifier. During a pathfinding process, the signal amplifier receives and transmits an offering signal to the amplifiers of the adjacent stage, an amplifier of the adjacent stage, if available, returns a catching signal. The amplifiers in the process are marked as being in a busy condition such that they are disabled from receiving further signals while in this condition, thus providing a busy marking.

3,626,111

SELECTION SYSTEM FOR CIRCUITS OR ELECTRIC EQUIPMENT

Georges A. Duval, Fresnes, and Jean F. Vigne, Montgeron, both of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 30, 1969, Ser. No. 820,413
Claims priority, application France, May 3, 1968, 150423
Int. Cl. H04q 3/42
U.S. Cl. 179—18 GF 2 Claims



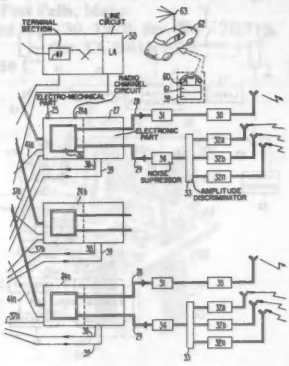
A switching network has three cascaded stages, each stage including a number of sections. Means associated with the secondary stage tests the availability of links in the primary and tertiary stages. When a match of idle primary and tertiary links is found, in association with an idle secondary link, the network operates to complete a path through all three stages.

3,626,112

AUTOMATIC MOBILE RADIOTELEPHONE NETWORKS

Andre Jean Henquet, Boulogne, Seine, France, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Apr. 3, 1968, Ser. No. 718,577
Claims priority, application France, Apr. 12, 1967, 102 503
Int. Cl. H04m 3/06; H04q 7/04
U.S. Cl. 179—41 A 1 Claim



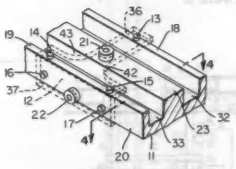
A switching scheme is provided for a telephone exchange having an attached switching section for serving mobile sets. Subscriber-line circuits are provided in the said section, each allotted to a mobile subscriber. A "Y" switching group in said section is equipped with twin cross-points, one branch of the "Y" leading to the radio circuits, the other to the mobile-suscriber circuits through a terminal switching group. The mobile-subscriber circuits are tested as to the class of service, busy condition etc., before a through-connection is established between a calling line in the exchange and a radio channel to reach the called mobile, or vice versa.

3,626,113

SLIDING TRANSDUCER CARRIAGE FOR DISC RECORDER

James W. Jones, and Herbert R. Stollorz, both of Redwood City, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Apr. 6, 1970, Ser. No. 25,793
Int. Cl. G11b 5/54, 21/04
U.S. Cl. 179—100.2 T 1 Claim

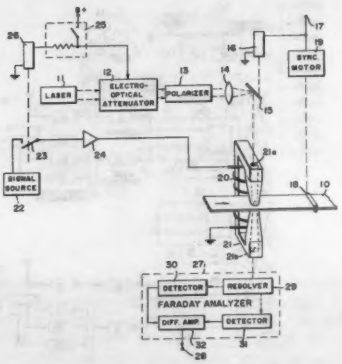


A carriage slide assembly for transporting a magnetic-transducing head relative to the surface of a magnetic storage disc wherein a carriage for the head is slidably disposed on a carriage arm formed of ferromagnetic material. In order to reduce inertia and sliding friction of the carriage, magnetic means in the form of a pair of permanent magnets are fixed to the carriage for spatial magnetic field coupling with the ferromagnetic arm thereby holding the carriage to the arm by magnetic force components generally transverse to the direction of carriage movement.

3,626,114
THERMOMAGNETIC RECORDING AND MAGNETO-OPTIC PLAYBACK SYSTEM

George W. Lewicki, Studio City, and John E. Gulsinger, Altadena, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 10, 1969, Ser. No. 805,549
Int. Cl. G11b *11/10, 5/32*
U.S. Cl. 179—100.2CH 9 Claims

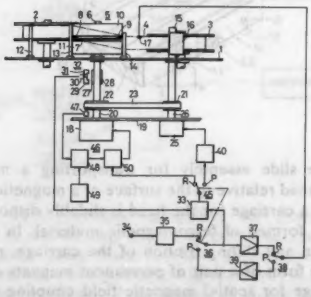


A magnetic recording and magneto-optic playback system is disclosed wherein thermomagnetic recording is employed. A transparent isotropic film is heated along a continuous path by a focused laser beam. As each successive area of the path is heated locally to the vicinity of its Curie point in the presence of an applied magnetic field, a magneto-optic density is established proportional to the magnetic field and fixed in place as the area cools once the laser beam moves on to an adjacent area. The magnetic field is varied by an input signal so that the magneto-optic density established in a given area of the film is proportional to the amplitude of the input signal being applied. To play back the recorded data, the intensity of the laser beam is reduced to avoid reaching the vicinity of the Curie point of the film as it is scanned by the laser beam in the same manner as for recording. A Faraday effect analyzer and photo detector are employed as a transducer for producing an output signal.

3,626,115
TRACKING SYSTEM FOR A VIDEO RECORDER USING AN AUXILIARY DC MOTOR COUPLED TO THE CAPSTAN

Yoshimi Watanabe, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 29, 1969, Ser. No. 820,133
Claims priority, application Japan, May 9, 1968, 43/30528
Int. Cl. G11b *15/52, 5/52;* M04n *5/78*
U.S. Cl. 179—100.2 S 1 Claim

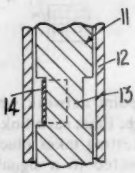


A magnetic recording and reproducing apparatus for video signals which is adapted to record a video signal on a magnetic tape which is transported by a capstan and reproduce the recorded video signal by means of a rotary magnetic head device, said apparatus including a main motor common to said capstan and the rotating shaft of said rotary magnetic head device, said main motor being mechanically coupled to the rotating shaft of said rotary magnetic head device and to said capstan through an elastic belt which has a viscosity and is adapted for expansion and contraction, and an auxiliary motor mechanically coupled to said capstan, said auxiliary motor being adapted to be controlled in accordance with a phase-comparison signal obtained by phase comparing a frequency signal resulting from the rotation of the rotating shaft of said rotary magnetic head device and a control frequency signal reproduced from said magnetic tape during the reproducing operation, whereby each one field of video signal is recorded in exact correspondence to each one magnetic track and reproduced therefrom.

3,626,116
IGNITION DISTRIBUTORS

William Harold Cooksey, Walsall, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England

Filed Aug. 4, 1969, Ser. No. 847,253
Claims priority, application Great Britain, Aug. 22, 1968, 40,175/68
Int. Cl. H01h *19/00*
U.S. Cl. 200—19 1 Claim

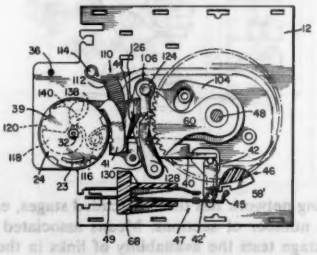


An ignition distributor for a road vehicle, including a casing and a driven shaft rotatably mounted within the casing, the driven shaft being adapted to be driven by the engine of the vehicle. A contact breaker assembly is mounted within the casing and a hollow cam shaft is mounted for limited angular movement of the driven shaft. The cam shaft is rotatable with the driven shaft to operate the contact breaker assembly, and the cam shaft is moved angularly relative to the driven shaft by a centrifugal mechanism to vary the ignition timing of the distributor. Interposed between the driven shaft and the cam shaft is a resilient member which damps angular movement of the cam shaft relative to the driven shaft while permitting the required angular movement of the cam shaft under the action of the centrifugal mechanism.

3,626,117
ESCAPEMENT AND TIMER UTILIZING SAME

Richard W. Stafford, Clayton, Ind., assignor to P. R. Mallory & Co. Inc., Indianapolis, Ind.

Filed Jan. 21, 1969, Ser. No. 792,578
Int. Cl. H01h *7/08*
U.S. Cl. 200—38 F 11 Claims



An escapement means for a timer utilizes a constant force coil spring such that the minimum force required to activate

a ratchet means coupled to the timer cam stack can be set and maintained during the operation of the timer.

3,626,118

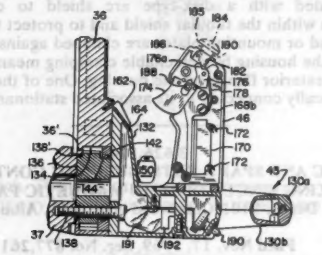
RADIAL ARM SAW WITH A DEPRESSIBLE KEY FOR UNLOCKING A SWITCH-ACTUATING TRIGGER

Harold R. Botefuhr, c/o Portable Electric Tools, Inc., 1200 E. State Street, Geneva, Ill.

Original application Nov. 14, 1966, Ser. No. 594,084, now Patent No. 3,482,610, dated Dec. 2, 1969. Divided and this application Aug. 13, 1969, Ser. No. 849,821

Int. Cl. H01h *27/06, 9/06*

U.S. Cl. 200—42 R 5 Claims



A handtool is provided with a manipulating handle and includes a key-operated structure such that the tool cannot be operated without the key being in position in the tool. In addition, in one form of the invention the tool will not operate unless the key is depressed to a predetermined position against a force tending to return the key to the inoperative position.

3,626,119

CONTROL UNITS FOR VALVE ACTUATORS

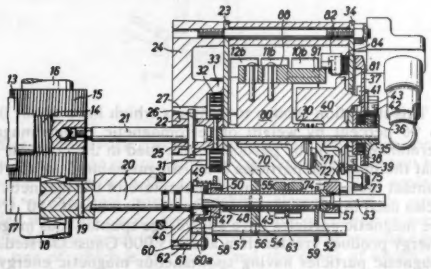
Jeremy J. Fry, Bath, England, assignor to Rotork Limited

Filed Mar. 11, 1970, Ser. No. 18,609

Claims priority, application Great Britain, Mar. 13, 1969, 13,260/69

Int. Cl. H01h *21/00*

U.S. Cl. 200—47 5 Claims



This invention relates to a unit for controlling electrical circuits. The control unit comprises a switch striker plate **40** which is mounted between a pair of switches **10***a*, **10***b* positioned opposite each other, the plate being movable to operate one or other of the switches to energize the appropriate circuit. A locking pawl **82** is pivotally urged downwardly to move a finger **85** into the path of movement of a projection **81** on the plate **40** so as to prevent its return movement to operate the other switch after one switch has been operated. The locking pawl is raised to release the plate **40** by means of a cam **92** on the end of a member **88**, the cam **92** engaging a cam surface **87** formed on the pawl **82** adjacent the finger **85**. The member **88** is carried by an auxiliary striker blade **80** pivotally movable with the switch-striker plate **40** in response to an output movement of associated apparatus.

The invention is particularly applicable for the control of the electric motor of an actuator with the switches controlling the electric circuit. The arrangement prevents operation of the opposite motor switch until the actuator begins to move in an opposite direction.

3,626,120

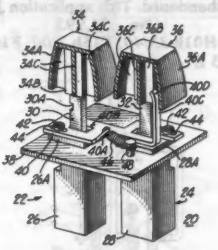
KEY-LOCKING ASSEMBLY

Duane H. Wright, Coeur D'Alene, Idaho, assignor to Clare-Pendar Co., Post Falls, Idaho

Filed Sept. 30, 1970, Ser. No. 76,718

Int. Cl. H01h *9/26*

U.S. Cl. 200—50 C 12 Claims



A key-locking assembly for a keyboard using manually depressed keys with key stems and skirted key buttons includes a movably mounted latching member resiliently biased against the stem of the key to be locked. This stem includes a notch normally disposed above the latching member which is moved into alignment with and receives the latching member when the key is depressed. The latching member includes an actuator arm extending upwardly adjacent the stem of the release key so that its free end is disposed adjacent an internal cam surface on the skirted button on this key. Depression of the release key causes the cam surface to engage the actuator and shift the latching member to release the locked key. This latching member is pivotally mounted in one embodiment, and is slidably mounted in another embodiment.

3,626,121

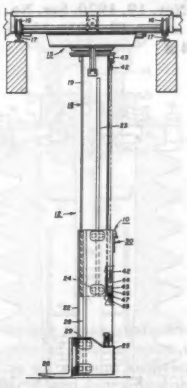
CENTRIFUGAL ACTUATOR

Walter A. Paulssen, Spring Lake, Mich., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed July 21, 1970, Ser. No. 56,792

Int. Cl. H01h *35/10*

U.S. Cl. 200—80 12 Claims



A device for mechanically actuating a control mechanism on a predetermined velocity being attained between relatively moving parts of an apparatus on which the control mechanism is operative. The device comprises an input section rotatably responsive to movement of the apparatus on which the control mechanism is supported. An output section

juxtaposed to the input section is normally disengaged therefrom and operatively detains the control mechanism against actuation. In response to excessive velocity increase, a plurality of balls inwardly detained in radially extending slots of the input section are centrifugally slung outward to rotatably couple the input and output sections for the latter to release the control mechanism for its actuation.

3,626,122

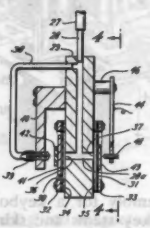
PRESSURE EQUALIZATION VALVE AND SWITCH

Dee D. Horton, and Dee D. Horton, Jr., both of Corpus Christi, Tex., assignors to Horton Automatics, Inc., Corpus Christi, Tex.

Continuation-in-part of application Ser. No. 834,985, June 20, 1969, now abandoned. This application July 2, 1970, Ser. No. 51,993

Int. Cl. H01h *35/40;* **F15b** *7/00;* **F16k** *21/16*

U.S. Cl. 200—83 E **5 Claims**



Apparatus for selectively venting a pressure-sensitive fluid system. Fluid pressure of the system is directed through a first conduit into a chamber having an expandable wall portion and through a second conduit which terminates in an opening adjacent and facing the external surface of the expandable wall. Small system pressure fluctuations are vented through the opening of the second conduit and large pressure changes cause the expandable wall portion to extend into sealing contact with the termination of the second conduit, thereby closing the vent opening. System fluid pressure may also be directed through a third conduit into a second expandable wall fluid chamber and the expansion of that wall utilized to actuate an electrical switch.

3,626,123

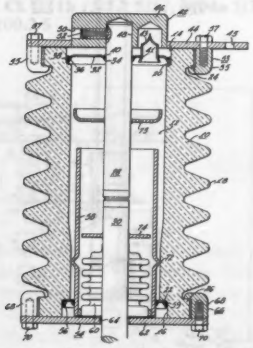
VACUUM-TYPE ELECTRICAL DEVICE

Herbert M. Pflanz, Westwood, and William E. Harper, Walpole, both of Mass., assignors to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Nov. 19, 1970, Ser. No. 91,001

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **8 Claims**



A vacuum interrupter comprises a hollow cylindrical housing having openings at opposite ends and is made of vacuum-tight ceramic. An integrally formed shoulder is provided inside the housing near each opening. A thin metallic end seal having a central opening abuts each shoulder and is sealed in place thereon. A stationary electrode extends from the exterior of the housing through the central opening in one end seal into the interior of the housing and is sealed to its end seal. A vacuum pinch-off tube is provided in the said one seal. A tubular metallic arc shield extends through the central opening in the other end seal into the interior of the housing, surrounds a portion of the stationary electrode and is sealed to its end seal. The tubular shield is immobilized by an external bead thereon which engages the inner wall of the housing. A movable electrode for cooperation with the stationary electrode extends into the housing through the tubular arc shield. A flexible bellows seals the space between the tubular arc shield and the movable electrode. Each electrode is provided with a disk-type arc shield to confine arc products within the tubular shield and to protect the bellows. Metal end or mounting plates are clamped against respective ends of the housing by detachable clamping means which engage an exterior flange on the housing. One of the end plates is electrically connected to its associated stationary contact.

3,626,124

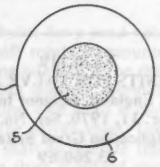
ARC AND SPARK EXTINGUISHING CONTACTS UTILIZING SINGLE DOMAIN MAGNETIC PARTICLES

Peter A. Denes, 9101 Crestwood Ave. N.E., Albuquerque, N. Mex.

Filed Nov. 17, 1969, Ser. No. 877,261

Int. Cl. H01h *9/30, 33/00*

U.S. Cl. 200—144 C **23 Claims**



This invention relates to contacts which have about 0.001 to 96 percent by weight of ferromagnetic or ferrimagnetic permanent magnetic particles embedded in the contacts such that the magnetic particles are distinguishable from the basic contact material. The Curie temperature of the magnetic particles used in the contacts are greater than about 250° C. and the magnetic particles have an average spontaneous magnetic energy product greater than about 5,000 Gauss.Oersted. The magnetic particles having spontaneous magnetic energy can also be incorporated in certain contact configurations to also obtain excellent noise suppression characteristics.

3,626,125

LEAK DETECTING MEANS FOR VACUUM SWITCHES

Akira Tonegawa, Yokohama-shi, Japan, assignor to Tokyo Shibaura Denki Kabushiki Kaisha (a/k/a Tokyo Shibaura Electric Co., Ltd.), Kanagawa-ken, Japan

Filed Nov. 18, 1969, Ser. No. 877,811

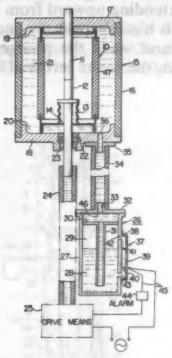
Claims priority, application Japan, Nov. 22, 1968, 43/85893

Int. Cl. H01h *33/66*

U.S. Cl. 200—144 B **6 Claims**

In a vacuum switch having a highly evacuated envelope and a pair of separable electrodes located within the envelope, the vacuum switch is positioned within an oiltight enclosure such that a space defined between the enclosure and the envelope of the vacuum switch is filled with an insulating

oil. The oil within the enclosure may penetrate into the envelope of the vacuum switch when a leak occurs in the



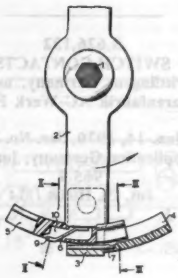
vacuum switch. The enclosure communicates with a detector which detects any leak that may occur in the vacuum switch.

3,626,126

HIGH-VOLTAGE DISCONNECTING SWITCH

Hermann Pesch, Witten, Germany, assignor to Wickmann-Werke Aktiengesellschaft, Witten-Annen, Germany

Filed Oct. 13, 1969, Ser. No. 865,732
Claims priority, application Germany, Oct. 23, 1968, P 18 04 661.2
Int. Cl. H01h *33/12*
U.S. Cl. 200—146 R **5 Claims**



A high-voltage rotary switch having a stationary main contact, a rotary main contact and an auxiliary arcing contact in electrical parallel with the rotary main contact. The arcing contact is the final circuit breaking element and is surrounded when the circuit breaks and arcing occurs by an arc-extinguishing chamber formed by two interacting arcuate elements one of which is stationary and the other of which is carried on the rotary contact.

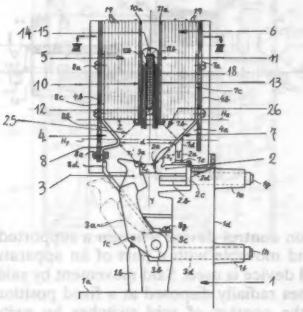
3,626,127

ARC-BREAKING AND QUENCHING UNIT FOR ELECTRIC CIRCUIT BREAKERS

Enrico Baldini, Bergamo, Italy, assignor to Magrini-Fabbriche Riunite Magrini Scarpa e Magnano-M.S.M.-S.p.A., Milan, Italy

Filed Mar. 9, 1970, Ser. No. 17,621
Claims priority, application Italy, Mar. 10, 1969, 13872 A/69
Int. Cl. H01h *33/18*
U.S. Cl. 200—147 R **6 Claims**

An arc-quenching system of the magnetic blast type for electric circuit breakers wherein a pair of cooperating circuit breaker contacts are disposed in an arc-quenching chamber and are juxtaposed with respective arc-splitting primary electrodes located on opposite sides of the chamber and a pair of arc displacement secondary electrodes spaced apart above the primary electrodes such that, upon opening of the circuit breaker contacts, the circuit breaking arc is generated initially between the open contacts and thereafter jumps between the contacts and the primary electrodes and a proximal secondary electrode as well as between the secondary electrodes to form an arc path consisting of a substantially regular hexagon at approximately 0.01 second subsequent to



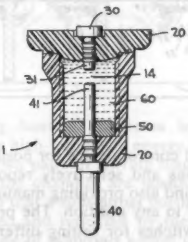
contact opening. The secondary electrodes are in series with a blast coil having magnetic poles flanking the secondary electrodes and inducing the arc to move upwardly through a quenching column formed with packs or stacks of ceramic plates adapted to increase the arc length. The cooperating juxtaposed contact surfaces of the circuit breaker contacts being substantially parallel immediately upon opening and lying in planes generally perpendicular to the arc path therebetween.

3,626,128

MERCURY SWITCH, INCLUDING A LIQUID ETHER FILLER HAVING A LOW-FREEZING POINT AND A HIGH-BOILING POINT

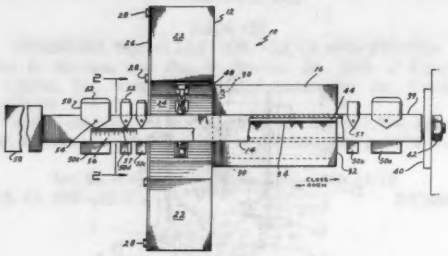
Gideon A. Du Rocher, Mt. Clemens, and Gerald L. McClure, Warren, both of Mich., assignors to Essex International, Inc.

Filed Feb. 4, 1970, Ser. No. 8,513
Int. Cl. H01h *29/00*
U.S. Cl. 200—152 **11 Claims**



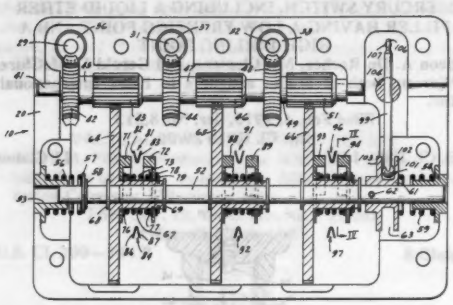
A mercury switch having a nonconductive housing within which is mounted a pair of spaced apart electrodes and a quantity of mercury in an amount sufficient to bridge the space between the electrodes depending on the position or movement of the switch. Also included in the housing is a filler of liquid ether, preferably butyl Cellosolve (ethylene glycol monobutyl ether), having a freezing point lower than that of mercury and a boiling point at least as high as 100° C., the liquid filler having a viscosity which changes little, if any, between the freezing temperature of mercury and 100° C.

3,626,129
POSITION CONTROL DEVICE
Cornelius E. Daly, Springfield, Mass., assignor to Koehring Company, Milwaukee, Wis.
Filed Jan. 21, 1970, Ser. No. 4,510
Int. Cl. H01h 3/42
U.S. Cl. 200—153 LA 7 Claims



A position control device wherein a supported track is affixed to and movable with a part of an apparatus on which the control device is used. Said movement by said track actuates switches radially disposed at a fixed position about said track by the contact of said switches by switch-actuating means adjustably disposed along said track and movable therewith.

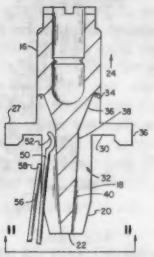
3,626,130
MEMORY AND CONTROL DEVICE WITH CAMS WHICH ACT IN BOTH RADIAL AND AXIAL DIRECTIONS
Burton L. Siegal, Skokie, Ill., assignor to Peter C. Granata, Jr., Chicago and Edward P. Andrychowski, Jr., Franklin Park, Ill., part interest to each
Filed Sept. 11, 1970, Ser. No. 71,460
Int. Cl. H01h 3/42, 3/54
U.S. Cl. 200—153 LB 16 Claims



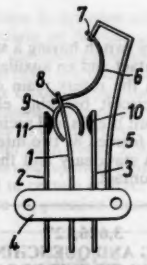
A memory and control device for positioning a power seat to preset positions and selectively repositioning it to such preset positions and also providing manual control of the seat to place the seat in any position. The present invention utilizes the same switches for setting different preset positions and utilizes cams on both sides of said switches which may be moved axially to selectively engage the switches to energize the power seat to the selected preset position.

3,626,131
PUSHBUTTON SWITCH
Charles Azel Barney, Stow, and Julian Joseph Bishop, Jr., Belmont, both of Mass., assignors to Ark-Les Switch Corporation, Watertown, Mass.
Filed Jan. 2, 1970, Ser. No. 358
Int. Cl. H01h 3/12, 3/14
U.S. Cl. 200—159 A 5 Claims

A momentary pushbutton electric switch featuring an elongated plunger, contained in a casing, and having one or more longitudinally extended grooves, cut more deeply into the plunger at the lower end, and tapering outward at the top of the groove, the floor of the groove providing a cam surface. In one or more of the grooves rides an inner terminal, while an outer terminal lies across and outside the same groove, both terminals extending upward from the bottom of the casing. The plunger is biased upwardly and outwardly of the casing by a spring, and when the plunger is in its upward, inoperative position, the inner terminal lies in the deeper part of the groove and the outer terminal is thus prevented from contacting it. When the plunger is depressed against the upward bias of the spring to its operative position, the inner terminal rides against the cam surface and is forced outwardly of the groove toward the circumference of the plunger until it contacts the outer terminal. The casing may be assembled in either of two ways, one way providing an upright pushbutton, the other providing a pushbutton tilted at an angle to the supporting surface.



3,626,132
SWITCH CONTACTS
Franz Jungels, Frittlingen, Germany, assignor to Heddernheimer Metallwarenfabrik AG-Werk Fluorn, Fluorn, Germany
Filed Jan. 14, 1970, Ser. No. 2,800
Claims priority, application Germany, Jan. 16, 1969, P 19 01 965.9
Int. Cl. H01h 1/34
U.S. Cl. 200—166 J 10 Claims



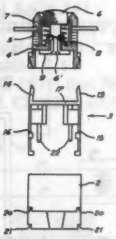
A switch mechanism in which the movable contact spring and/or the fixed contact is provided with a pivotally mounted yoke forming at least one of the contact surfaces. The yoke is arcuate having a U-shaped cross section and mounted on a bearing edge formed from the contact spring so that when the spring is deflected, the yoke acts in sliding, rolling and frictional engagement with the opposing contact face.

3,626,133

PRESS SWITCH HAVING A SNAP FIT FORK BETWEEN THE BODY AND CONTROL MEMBER

Angelo Teruzzi, Milan, Italy, assignor to Breter S.P.A., Milan, Italy

Filed Mar. 16, 1970, Ser. No. 19,723
Claims priority, application Italy, Mar. 26, 1969, 14597 A/69
Int. Cl. H01h 9/02, 13/04
U.S. Cl. 200—168 R 7 Claims



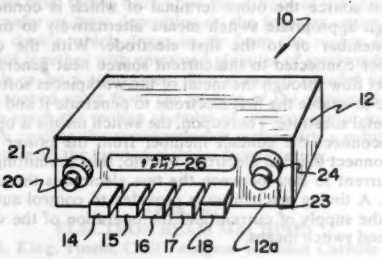
A press switch comprising a control assembly, at least one body for containing the electrical contact elements of the switch, and at least a fork means for snap fitting with said control assembly and said at least one body, respectively.

3,626,134

ROTARY ACTUATOR FOR SLIDE SWITCH

Norbert J. Kazyk, Norridge, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Feb. 4, 1970, Ser. No. 8,671
Int. Cl. H01h 3/02
U.S. Cl. 200—172 7 Claims



A switch-actuating device is mounted within a housing to convert rotary movement of a selector knob into linear movement to actuate a slide switch mounted within the housing. The shaft which carries the knob outwardly of the housing has a crank extending rearwardly behind the wall of the housing to engage a pivotal member which pivots about an axis transverse to the axis of rotation of the shaft. The pivotal member is loosely coupled to the crank at one end thereof and has the other end thereof coupled to a slide actuator on the switch body to move the actuator linearly between its two selectable positions.

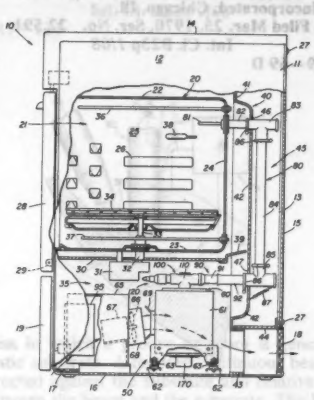
3,626,135

ELECTRONIC OVEN WITH FERRITE RF REJECTION FILTERS

Louis H. Fitzmayer, Louisville, Ky., assignor to General Electric Company

Filed Nov. 19, 1969, Ser. No. 877,989
Int. Cl. H05b 9/06
U.S. Cl. 219—10.55 8 Claims

There is disclosed an electronic oven comprising a generator of microwave energy of a predetermined frequency coupled to a cooking cavity and to a source of DC and 60 cycle operating potentials by a coupling structure, the coupling structure including an RF rejection filter comprising coaxial inner and outer conductors insulated from each other, the inner conductor having a cylindrical ferrite member and a cylindrical metal slug therein of such diameter that the filter



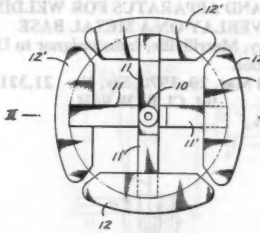
operates as a lossy transmission line, terminated in a capacitance for highly attenuating the predetermined frequency and all harmonics thereof up to the seventh harmonic.

3,626,136

HIGH-FREQUENCY HEATING APPARATUS

Michio Funahashi, Otsu, Japan, assignor to Sanyo Electric Co., Ltd., Osaka-fu, Japan

Filed May 11, 1970, Ser. No. 36,007
Claims priority, application Japan, May 14, 1969, 44/44857
Int. Cl. H05b 9/06, 1/00
U.S. Cl. 219—10.55 12 Claims



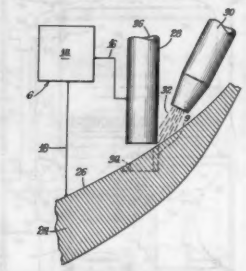
A high-frequency heating apparatus includes a supply source for supplying high-frequency energy into a conductive heating chamber. Two pairs of stirring blades mounted on a rotary shaft inside the chamber are positioned relatively to the supply source so that a substantial portion of the radiated energy is intercepted and reflected by the blades to afford more uniform heating of materials within the chamber. The generally elongated stirring blades are mounted tangentially of the circumference of an imaginary circle lying in a plane normal to the rotary shaft and concentric with the shaft axis. The blades of each pair lie in parallel planes inclined at an angle of 45° with respect to the plane of the imaginary circle and thus are oppositely inclined with respect to the axis of the rotary shaft. As the blades are rotated, high-frequency energy from the source, in a first mode, is reflected from the upper surface of one of the blades of the pair in a centrifugal direction and, in a second mode, from the upper surface of the other blade in a centripital direction toward the first blade of the pair and reflected downwardly from the lower surface of the latter. Continuous rotation of the shaft effects a continuously alternating sequence of the modes thus established by each pair of blades.

3,626,137

METHOD OF ELECTRICAL DISCHARGE MACHINING

Robert Bernard Bertolasi; Douglas Martin Hood, and Walter Avery Strange, all of Rockford, Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Mar. 25, 1970, Ser. No. 22,591
Int. Cl. B23p 1/08
U.S. Cl. 219—69 D 11 Claims



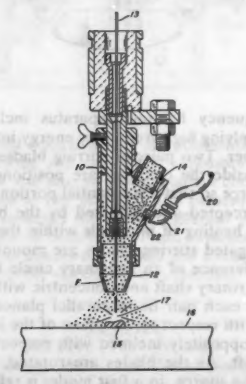
In electrical discharge machining, material is eroded away from a workpiece by electrical discharges occurring between an electrode and the workpiece. Coolant, that will change from a liquid to a gaseous state at a temperature and pressure below the temperature and pressure around the workpiece, is introduced in its liquid state into the gap between the electrode and the workpiece at the same time electrical discharges are passed across said gap. The liquid coolant experiences a temperature increase and a pressure decrease in the gap and flashes into its gaseous state thereby increasing in volume. Such volumetric increase results in a rapid gas flow away from the gap into the area around the workpiece that removes eroded particles. The change of state from a liquid to a gas is also accompanied by a decrease in temperature of the surrounding area including the electrode and the workpiece.

3,626,138

METHOD AND APPARATUS FOR WELDING AN OVERLAY ON A METAL BASE

Forbes M. Hurley, Merrillville, Ind., assignor to United States Steel Corporation

Filed Mar. 20, 1970, Ser. No. 21,321
Int. Cl. B23k 9/04
U.S. Cl. 219—76 1 Claim



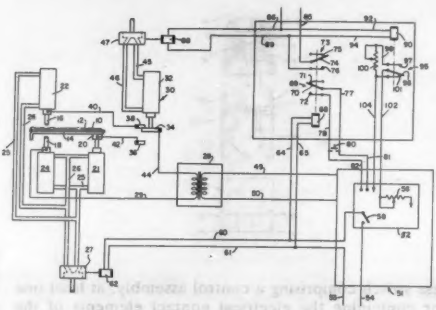
A method and apparatus for welding an overlay on a metal base. The welding apparatus contains a supply of granular flux which feeds through a nozzle and covers the weld. An inert gas is introduced to the flux supply to purge it of air. The gas discharges through the nozzle and assists in protecting the weld. Particularly useful for welding an overlay of a nickel tantalum alloy.

3,626,139

WELDING APPARATUS

Oran J. Sands, c/o Arvin Industries, Inc., Columbus, Ind.

Original application Feb. 20, 1969, Ser. No. 801,065, now Patent No. 3,578,940. Divided and this application June 29, 1970, Ser. No. 50,682
Int. Cl. B23k 9/28, 11/10
U.S. Cl. 219—86 8 Claims



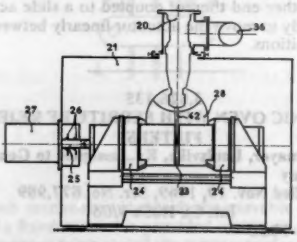
A welding apparatus and method for spot-welding a first metal workpiece having a plastic covered surface to a second metal workpiece. The two workpieces are placed in metal-to-metal engagement and clamped between the electrodes of two aligned welding guns, a first electrode engaging the plastic surface of the first workpiece and a second electrode engaging the second workpiece. At a point spaced from the second electrode, the metal of the second workpiece is engaged by a contact member between which and the second electrode an electric current can flow through the metal. The second electrode is connected to one terminal of a welding-current source the other terminal of which is connectable through appropriate switch means alternatively to the contact member or to the first electrode. With the contact member connected to the current source heat generated by current flow through the metal of the workpieces softens the plastic to enable the first electrode to penetrate it and engage the metal substrate. Thereupon, the switch means is operated to disconnect the contact member from the power source and connect the first electrode thereto, thus permitting welding current to flow between the two electrodes through the metal. A timing mechanism is provided to control automatically the supply of current and the operation of the welding guns and switch means.

3,626,140

WELDING IN DEPTH

Jean-Pierre Peyrot, 8, domaine du Bel-Abord, Chilly-Mazarin, Essonne, France

Filed Oct. 9, 1969, Ser. No. 865,139
Claims priority, application France, Oct. 10, 1968, 169492
Int. Cl. B23k 9/00
U.S. Cl. 219—121 EB 3 Claims



A method of welding together two elements with an electron bombardment beam, comprising the following steps: preparing each of the two parts to be welded with a support-

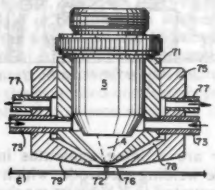
ing toe and a chamfer, the assembly of the chamfers of the two parts, when the supporting toes are in contact with each other, having a ratio of the depth p to the width l at least equal to 10, the width l not exceeding 5 mm.; effecting, by means of the beam of an electron gun, the welding of the surfaces of the supporting toes in order to assemble the parts in contact along the said supporting toes; progressively filling the chamfer with a metal filler; welding the said metal filler to the surfaces of the chamfer.

3,626,141

LASER SCRIBING APPARATUS

Richard T. Daly, Huntington, N.Y., assignor to Quantronix Corporation, Farmingdale, N.Y.

Filed Apr. 30, 1970, Ser. No. 33,245
Int. Cl. B23k 9/00
U.S. Cl. 219—121 L 7 Claims



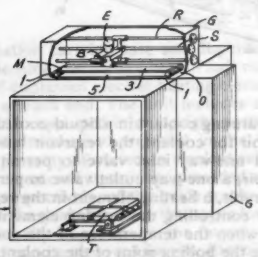
Apparatus for scribing semiconductor wafers including a laser, focusing optics and a drive mechanism for moving the focal spot of the laser beam along a prescribed path on the surface of a semiconductor wafer. Globules of material ejected from the wafer by the action of the laser beam are prevented from falling back upon the surface of the semiconductor wafer or from depositing on the focusing optics by a vacuum device which draws in air from the region of the focal spot together with entrained globules of semiconductor material, or by a transparent film disposed parallel to and slightly spaced apart from the surface of the semiconductor wafer to catch the molten globules of semiconductor material, or by coating the semiconductor wafer with a substance which prevents the ejected globules from sticking.

3,626,142

ELECTRON BEAM MACHINE

James R. King, Tustin, Calif., assignor to Union Carbide Corporation, New York, N.Y.

Filed May 1, 1970, Ser. No. 33,685
Int. Cl. B23k 15/00
U.S. Cl. 219—121 EB 2 Claims



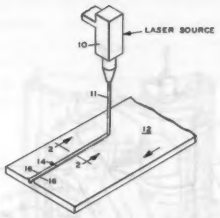
An electron beam machine wherein the electron gun is housed in a gun chamber separate from the vacuum chamber housing the work. A moveable seal is maintained around the gun and between the gun chamber and the vacuum chamber.

3,626,143

SCORING OF MATERIALS WITH LASER ENERGY

Franklin Hornor Fry, Appleton, Wis., assignor to American Can Company, New York, N.Y.

Filed Apr. 2, 1969, Ser. No. 812,764
Int. Cl. B23k 9/00
U.S. Cl. 219—121 3 Claims



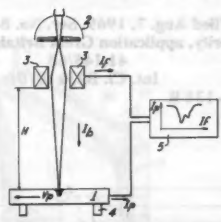
A process in which a groove or score is generated in a thermoplastic substrate. A focused continuous beam of laser light is directed against the substrate and relative motion is applied between the beam and the substrate. The laser beam is generated and focused with suitable optics so that the beam has sufficient energy density to degrade the plastic material. The relative velocity between the beam and the substrate is such that the beam degrades the substrate without cutting through the substrate and thereby forms a groove in the substrate with a bead bordering the groove.

3,626,144

METHOD OF ADJUSTMENT OF FOCUSING IN ELECTRON BEAM WELDING

Marcel Boncoeur, Paris; Jean-Yves Marhic, Fresnes, and Michel Rapin, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Oct. 24, 1969, Ser. No. 869,199
Claims priority, application France, Oct. 25, 1968, 171534
Int. Cl. B23k 15/00
U.S. Cl. 219—121 EM 2 Claims



Method for reproducing welding conditions with respect to an electron beam welding arrangement wherein, with beam acceleration and the physical parameters of the arrangement maintained constant, the values of target current versus focusing current are recorded as the focusing current is varied over a range, and then, at a later time when the same weld is desired for a particular value of focusing, the focusing current is first adjusted until a peak in the target current is reached which corresponds to a peak previously recorded and the focusing current is further adjusted by a value which is equal to the difference between the initial target currents for the range as recorded and newly measured.

3,626,145

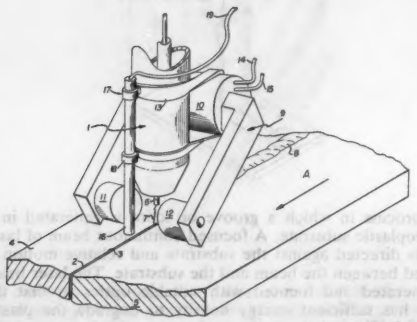
MAGNETIC CONTROL OF ARC ENVIRONMENT

James F. Jackson, Franklin, Ohio, assignor to Armco Steel Corporation, Middleton, Ohio

Filed Feb. 2, 1970, Ser. No. 7,946
Int. Cl. B23k 9/08
U.S. Cl. 219—123 7 Claims

Control means for the arc of an automatic DC electric welding device comprising an electromagnet with its mag-

netic poles aligned perpendicular to the arc and the seam to be welded and providing a preselected and optimized magnetized environment for the arc. A Hall-effect probe is located immediately ahead of the welding arc to detect the magnitude and direction of the effect on the magnetic environment of detrimental magnetic fields in the immediate vicinity of the welding operation. The Hall-effect probe is



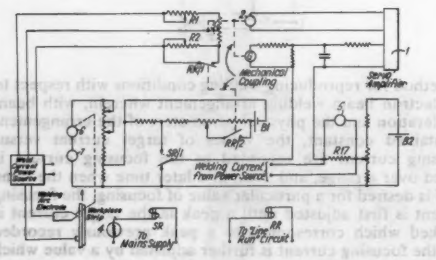
connected through a detector circuit and a control circuit to the power supply for the electromagnet. Upon detection of the magnitude and direction of the effect of a detrimental magnetic field by the Hall-effect probe, appropriate adjustment is made of the power supplied to the electromagnet through the detector and control circuits, enabling the electromagnet to nullify the effect of the detrimental field on the preselected magnetic environment.

3,626,146

WELD CURRENT CONTROLLER

Colin Francis Greening Smith, Chandlers Ford, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Aug. 7, 1969, Ser. No. 848,274
Claims priority, application Great Britain, Aug. 28, 1968, 41,145/68
Int. Cl. B23k 9/10
U.S. Cl. 219—131 R **7 Claims**



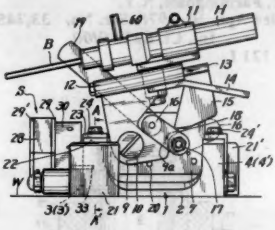
An arc welding current control system establishes predetermined operating current levels during deenergized, starting and running conditions. Switching circuits provide signals to a servoamplifier which drives a motor and potentiometer to control the current to a weld current power source. Changes from the desired level are detected and compensated for. A protective circuit automatically reduces the current level when the welding arc is off and provides an operating current only when the arc is on.

3,626,147

UNDERWATER ARC WELDING APPARATUS WITH PIVOTAL BASE

Sadao Sato, Tokyo, Japan, assignor to Kakumaru Industry Company Limited, Tokyo, Japan

Filed Sept. 10, 1969, Ser. No. 871,002
Claims priority, application Japan, June 30, 1967, 42/55823 June 14, 1967, 42/37530
Int. Cl. B23k 9/00
U.S. Cl. 219—136 **6 Claims**



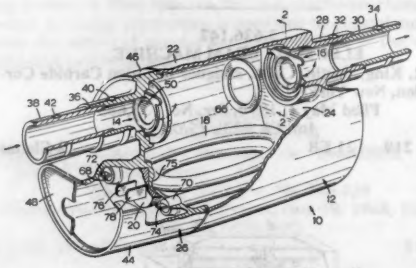
An underwater arc welding apparatus in which a composite consumable welding electrode, which transmits gas to the arc zone, is mounted in a support mechanism for pivotal movement and automatic underwater welding.

3,626,148

ELECTRIC ENGINE COOLANT HEATER

Walter J. Woytowich, Deep River, Ontario, and Charles G. Shepherd, Oakville, Ontario, both of Canada, assignors to Bardon Research and Development Limited, Toronto, Canada, a part interest

Filed May 26, 1969, Ser. No. 827,767
Int. Cl. F02n 17/04; F24h 1/10; H05b 1/02
U.S. Cl. 219—208 **7 Claims**

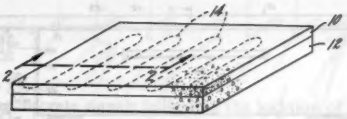


A heater for warming coolant in a liquid-cooled engine, including a reservoir for coolant, the reservoir having an inlet and an outlet, a one-way inlet valve to permit coolant to enter the reservoir, a one-way outlet valve to permit coolant to leave the reservoir, a heating element in the reservoir, and a thermostat for controlling the heating element. The thermostat cuts out when the temperature of the coolant in the reservoir is above the boiling point of the coolant, so that the coolant is vaporized. After the heating element is turned off, the remaining vapor in the reservoir condenses, and the resulting partial vacuum draws in a fresh charge of coolant through the inlet, some of which proceeds immediately through the outlet to ram the heated coolant through the cooling system. The heating element is again energized and the cycle is repeated.

3,626,149
THERMALLY CONDUCTIVE CONCRETE WITH HEATING MEANS

Peter R. Carney, Lake Forest, and Raymond F. Stevens, Stickney Township, Cook County, both of Ill., assignors to Superior Graphite Company, Chicago, Ill.

Filed Jan. 2, 1970, Ser. No. 65
Int. Cl. H05b *1/00*
U.S. Cl. 219—213 **8 Claims**

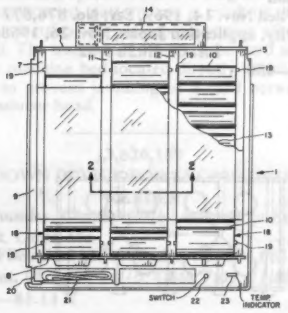


An improved ground covering and heating means is constructed by formulating graphited concrete containing about 35–85 percent graphite, based on the weight of the dry mix. The concrete is laid in combination with a suitable heating element beneath the upper surface. In the preferred embodiment, the graphited concrete is sandwiched with a lower layer of nongraphited concrete for added strength. In preparing the sandwich, the graphited concrete is preferably poured over the nongraphited concrete while the latter is still in a green state.

3,626,150
CARRYING CASE AND DISPENSER FOR ELECTRICALLY HEATED HAIR CURLERS

Richard Q. Kress, Greenwich, Conn., assignor to U.S. Philips Corporation

Filed Oct. 29, 1969, Ser. No. 872,247
Int. Cl. A45d *2/36, 4/16;* H05b *1/00*
U.S. Cl. 219—222 **6 Claims**

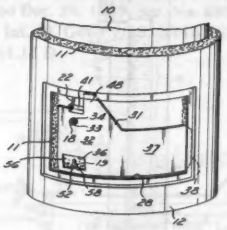


A combination carrying case and dispensing unit for storing and dispensing electrically heated hair curlers of the type having a self-contained electric heating element and terminal projections at each end. The unit includes a dispensing tray arranged to be supported in an upright position by its cover. Parallel guide tracks are provided in the tray for accommodating a plurality of curlers in stacked relation. A loading station and a removal station are provided at the upper and lower ends, respectively, of the guide tracks whereby curlers inserted into the guide tracks at the upper loading station will be gravitationally supplied to the lower removal station whereat they can be removed for use. Electrically conductive rails within the guide tracks conductively engage the terminal end projections of the stacked curlers and permit electric power to be simultaneously applied to an entire stack of curlers to heat the same. A temperature indicator is provided for indicating when the curlers have been sufficiently heated and are ready for use. A lighted makeup mirror is provided across the front of the dispensing tray.

3,626,151
PROTECTOR SHIELD

Edward G. Them, and Bernard S. Deubel, both of Mansfield, Ohio, assignors to Therm-O-Disc Incorporated, Mansfield, Ohio

Filed Oct. 15, 1970, Ser. No. 80,908
Int. Cl. F24h *1/00*
U.S. Cl. 219—328 **10 Claims**

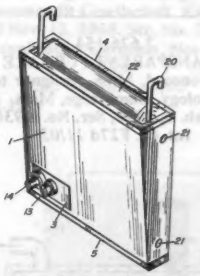


A protective shield for the terminals of thermostats mounted on water heaters is disclosed. The shield is formed of heavy fish paper shaped to provide access to the thermostat controls while preventing accidental contact with the terminals and connecting leads. Mounting portions are provided on the shield for removably mounting the shield in place.

3,626,152
RADIANT ENERGY WARMER-DRIER FOR TEXTILE ARTICLES

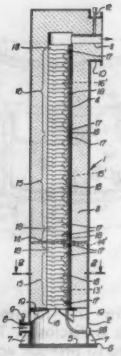
Anthony J. Governale, Manhasset, and Rolf A. Zurwelle, Port Washington, both of N.Y., assignors to Elektra Systems, Inc., Farmingdale, N.Y.

Filed Feb. 6, 1970, Ser. No. 9,222
Int. Cl. F26b *23/06;* H05b *3/02*
U.S. Cl. 219—342 **2 Claims**



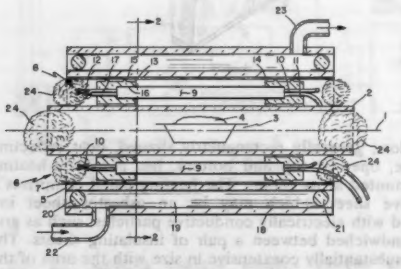
A hollow, generally rectangularly shaped, heat reflecting enclosure, open at top and bottom, has a radiant-heating panel mounted at its center. The heating panel comprises a conductive sheet, which may be an asbestos sheet impregnated with electrically conductive particles, such as graphite, sandwiched between a pair of insulating sheets. The panel is substantially coextensive in size with the area of the larger sides of the enclosure. Top and bottom mounting brackets connected to the sides of the panel support the panel in spaced parallel relation to the larger sides of the enclosure, whereby textile articles such as towels, hosiery and undergarments may be hung over the heating panel within the enclosure for quick, safe drying and warming. An off-on switch and thermostat are connected in series with the heating panel for regulating the energization thereof.

3,626,153
ELECTRIC HALIDE VAPOR HEATER
Anthony Horton, Welwyn Garden City, England, assignor to Laporte Titanium Limited, London, England
Filed Mar. 25, 1969, Ser. No. 810,190
Claims priority, application Great Britain, Apr. 3, 1968, 15,983/68
Int. Cl. H05b *3/00*; F24h *3/04*
U.S. Cl. 219—374 2 Claims



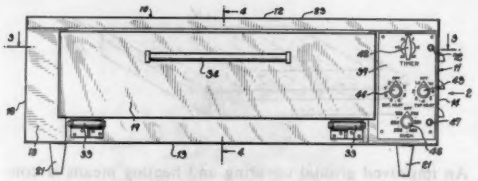
A process and apparatus for heating the vapor of a halide of an element selected from the group consisting of titanium, silicon, aluminum, zirconium and iron and mixtures of such halides. The vapor to be heated is passed through a plurality of ducts which are arranged in parallel relation with one another and in which the vapor comes into contact with a plurality of resistance elements provided in the ducts. The resistance elements are formed of platinum or an alloy of platinum with rhodium, ruthenium or iridium. The inner surface of the ducts are formed of a nonmetallic refractory material which is inert with respect to the halide vapor to be heated. The vapor, in passing through the ducts, is heated by convection from the resistance elements and by radiation from the walls of the ducts.

3,626,154
TRANSPARENT FURNACE
Thomas B. Reed, Concord, Mass., assignor to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Feb. 5, 1970, Ser. No. 8,936
Int. Cl. F27d *11/02*
U.S. Cl. 219—411 15 Claims



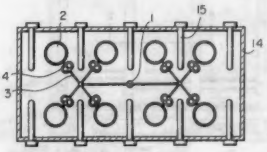
A furnace which heats by infrared radiation includes a wall portion of material transparent to visible radiation having a layer of selected material on the inside thereof, which reflects substantially all infrared radiation and yet transmits sufficient visible radiation so that the inside of the furnace can be viewed from the outside.

3,626,155
ELECTRIC OVEN
Stanley V. Joeckel, Wayne, N.J., assignor to Irex Corporation, Riverdale, N.J.
Filed Nov. 30, 1970, Ser. No. 93,762
Int. Cl. F27d *11/02*
U.S. Cl. 219—411 4 Claims



An electric oven for rapidly heating therein frozen convenience food in containers placed on plates having a thermal conductivity approximately equivalent to that of the food and means for pulsing heat energy upwardly through the plate and container into the food mass at timed intervals, pulsing infrared heat downwardly into the food mass at a predetermined wavelength range while reflecting a portion of the infrared heat to produce a required ambient condition, and regulating the air temperature within the oven, whereby a maximum tolerable rate of temperature rise in the food by conduction, radiation, and convection is provided.

3,626,156
TEMPERATURE CONTROL OF A JACKETED-CHAMBER OF MELT SPINNING MACHINE
Haruki Takizawa, and Nobuo Muramatsu, both of Matsuyama-shi, Japan, assignors to Teijin Limited, Kita-ku, Osaka, Japan
Filed Nov. 14, 1969, Ser. No. 876,877
Claims priority, application Japan, Nov. 26, 1968, 43/86488
Int. Cl. H05b *3/02*
U.S. Cl. 219—480 2 Claims

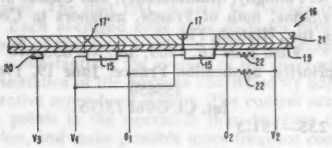


The heating powers of the heaters positioned at the both ends of a hermetically sealed and heat-insulated chamber enclosing a group of spinning heads and having electric heaters for heating a heating medium therein, wherein every spinneret assembly is positioned between said heaters, are reduced to 30–90 percent of those of the others, the currents supplied to said heaters being all at once on-off operated by means of a temperature controller.

3,626,157
FIELD-EFFECT PERFORATED MEDIA READER
William R. Smith, and Neal L. Walters, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 28, 1969, Ser. No. 828,545
Int. Cl. G06k *7/06*; G11c *13/00*; H03k *17/60*
U.S. Cl. 235—61.11 A 10 Claims

A perforated media reader using field-effect devices for

sensors in which the media acts as one electrode of selected sensors as a function of the perforation pattern, thereby



generating discrete signals indicating the location of the perforations.

3,626,158

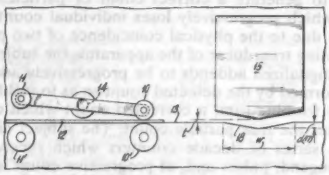
ANTIJAMMING APPARATUS FOR MAGNETIC CARD READER

Murray D. Lawrence, Kings Park, N.Y., assignor to Potter Instrument Company, Inc., Plainview, N.Y.

Filed Mar. 4, 1970, Ser. No. 16,491

Int. Cl. G06k *7/08*; G11b *5/58*

U.S. Cl. 235—61.11 D **3 Claims**



A data processing system utilizes a magnetic transducer to sense a binary-coded pattern on a card or the like and produces an electrical output representative of the information encoded. The transducer contacts the card and there is a recess in the machine bed located directly beneath the transducer head to prevent jamming of a card between the bed and the transducer head.

3,626,159

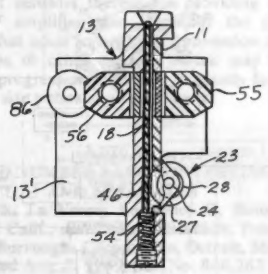
HOLDDOWN DEVICE FOR ENCODED MEMBER READER

Calvin L. Chumley, Glendale, Mo., assignor to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 11, 1969, Ser. No. 884,081

Int. Cl. B65h *23/16*; G06k *7/00, 21/00*

U.S. Cl. 235—61.11 R **5 Claims**



An encoded card reader is disclosed which includes a chamber for receiving an encoded card to be scanned by a reading mechanism, and a holddown mechanism including resiliently compressible rollers movable between a first position wherein the peripheral surfaces of the rollers facing the encoded card are shaped to permit insertion of the encoded card past the rollers, and solenoid means for rotating the rollers into a second position wherein other peripheral portions of the rollers resiliently engage and urge the card into a desired predetermined position for scanning.

3,626,160

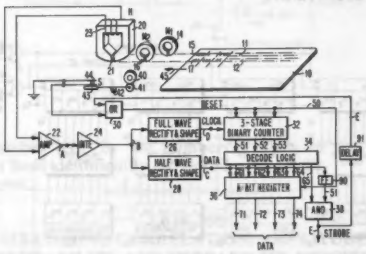
MAGNETIC RECORD SENSING DEVICE

Jacob John Hagopian, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 29, 1969, Ser. No. 888,629

Int. Cl. G06k *7/08*; G11b *5/00*

U.S. Cl. 235—61.11 D **5 Claims**



A single channel processing system for reading magnetic credit cards having two parallel tracks of discrete complementary data bits. Two prebiasing magnets bias the data bits and complementary bits in opposite directions, and a single read back head scans both tracks simultaneously.

3,626,161

METHOD OF PRODUCING A CHARACTER OR PATTERN ORIGINAL FOR USE IN QUANTIZING A CHARACTER OR PATTERN AND OBTAINING DIGITAL DATA THEREFROM BY PHOTOELECTRICAL SCANNING

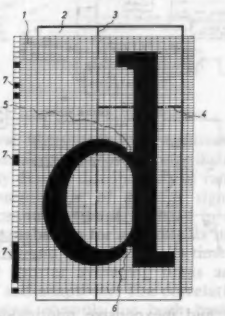
Roman Koll, Kiel-Wellingdorf, Germany, assignor to Dr.-Ing. Rudolf Hell Kommandit Gesellschaft, Kiel, Germany

Filed Nov. 12, 1968, Ser. No. 774,767

Claims priority, application Germany, Nov. 29, 1967, P 15 97 775.0

Int. Cl. G06k *19/00*

U.S. Cl. 235—61.12 N **6 Claims**



Method of producing a character or pattern original for use in the quantization and production of digital data corresponding thereto, by photoelectrical scanning, in which the initial pattern or character representation is initially adapted to a registered lined grid by so disposing a transparent sheet carrying the pattern or character representation with respect to the grid that as many as possible vertical and horizontal straightedge lines of the character or pattern coincide with

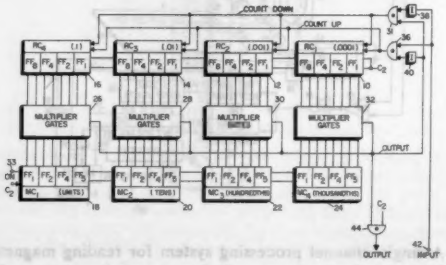
the corresponding raster lines, and as many as possible curvilinear edge lines thereof touch raster lines, and eliminating deviations still existing between edge and raster lines by removing the part of the character extending beyond the raster line or filling in the raster field in which it extends, making such selection on the basis of which would result in the smallest possible change in shape of the character or pattern.

3,626,162

AUTOMATIC DIGITAL TIME CONSTANT SYSTEM

John M. Rhoades, Waynesboro, Va., assignor to General Electric Company

Filed Mar. 27, 1969, Ser. No. 811,003
Int. Cl. G06m *3/14*
U.S. Cl. 235—92 DM **5 Claims**



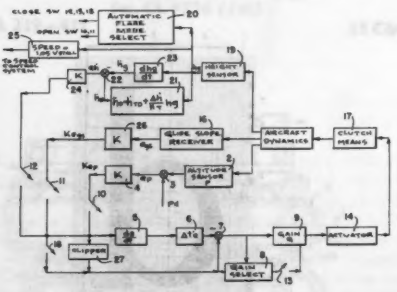
A digital system for providing a smoothing effect to changes in the rate of digital information being supplied. The system includes a reversible counter and a rate multiplier. The system performs a function analogous to an RC circuit in an analog system.

3,626,163

AUTOMATIC LANDING SYSTEM

Daniel O. Dommasch, Blawenburg, N.J., assignor to The United States of America as represented by the Secretary of the Army and/or the Administrator of the Federal Aviation Administration

Filed Jan. 28, 1970, Ser. No. 6,637
Int. Cl. B64c *19/00*
U.S. Cl. 235—150.22 **6 Claims**



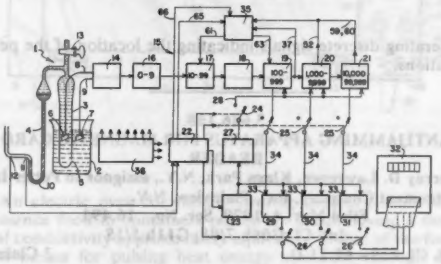
A simple and inexpensive multimode automatic landing system comprising altitude hold means, glide slope control means, and flare control means. Air data sensing means are utilized in all systems, and the systems use common logic circuitry. Control of altitude is through the throttle and speed control is obtained by operation of the aircraft longitudinal control surfaces. The automatic landing system is designed to operate in parallel with the pilot so that it can be manually overriden at any time; however, when the controls are left free, the system will land the aircraft independently of the pilot.

3,626,164

DIGITALIZED COINCIDENCE CORRECTION METHOD AND CIRCUITRY FOR PARTICLE ANALYSIS APPARATUS

Jacques A. Pontigny, Montmorency, and Claude J. Collineau, Epinay/Seine, both of France, assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 16, 1969, Ser. No. 833,646
Claims priority, application France, June 19, 1968, 155649, 155650
Int. Cl. G06f *15/36*
U.S. Cl. 235—151.3 **42 Claims**



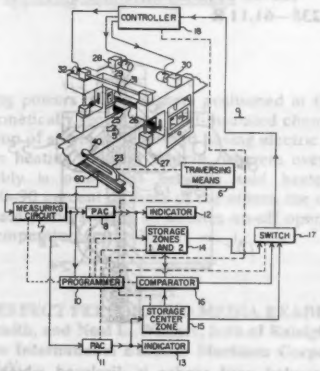
So as to generate a correct count of particles from apparatus which progressively loses individual counting pulses primarily due to the physical coincidence of two particles in the detecting transducer of the apparatus, the subject method enables digitalized addends to be progressively added to the augend formed by the detected count so as to yield, as a continuously forming sum, a corrected count which closely approximates the true particle count. The subject circuitry includes a series of decade counters which receive the detected, augend, pulses and, at progressive count levels, such as increments of one thousand, enable, and/or trigger a selected one of a plurality of correction establishing circuits, to deliver one or more addend related signals to a selected one of the decade counters. Depending upon the number of such related signals and the numeric rank of the receiving decade counter, a predetermined addend is supplied. This trigger and feedback relationship increases the increments of addend as the detected count increases.

3,626,165

CONTROL SYSTEM

Robert E. McCall, Columbus, Ohio, assignor to Industrial Nucleonics Corporation

Filed Jan. 10, 1969, Ser. No. 790,380
Int. Cl. G01d *21/00*
U.S. Cl. 235—151.3 **6 Claims**



A control system for a rubber calender incorporates features that improve profile and machine direction thickness control. In one embodiment a single gauge scans continu-

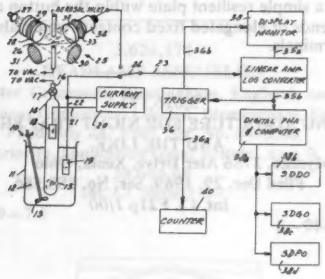
ously across the rubber sheet and is coupled to a first profile average computer (PAC) to average the thickness of one edge zone. While the gauge is scanning the first zone the gauge is also coupled to a second PAC that averages the thickness of a center zone including contiguous portions of the edge zones. The first PAC is used to average the other edge zone. Each averaged edge zone includes substantially the entire half of the sheet width, so that the average of the edge zones is substantially the average of the sheet width and more representative of the portions controlled by adjustment of the respective screwdown motors. The control actions are initiated at points in the operation that decrease the scan cycle duration, and make possible more frequent control actions.

3,626,166

PARTICLE PULSE ANALYZING APPARATUS EMPLOYING LINEAR AMPLIFICATION AND LOGARITHMIC CONVERSION

Robert H. Berg, Elmhurst, and Lynn E. Ellison, Crystal Lake, both of Ill., assignors to Robert H. Berg, Elmhurst, Ill.

Filed Apr. 15, 1970, Ser. No. 28,703
Int. Cl. G06f *15/46*; **G06g** *7/24*
U.S. Cl. 235—151.35 **10 Claims**



Analysis of particle populations on a logarithmic size basis is provided by electronic apparatus including a linear amplifier for receiving particle size pulses and a logarithmic converter for providing corresponding logarithmically scaled pulses to a pulse monitor oscilloscope and other signal processing and display devices. The linear amplifier includes a plurality of amplifying stages which increase signal strength and enhance signal quality, one of the stages having selectively switched resistors therein for providing a geometric progression of amplifier gain steps for the pulses being processed so that upon logarithmic conversion a display on the oscilloscope or other readout device may be adjusted through a like progression of display to greatly facilitate analysis of particle size pulses at all size levels.

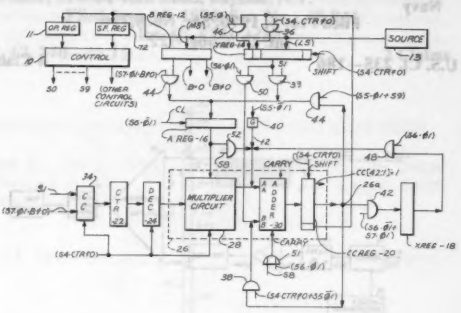
3,626,167

SCALING AND NUMBER BASE CONVERTING METHOD AND APPARATUS

LeRoy R. Guck, La Verne; Lawrence G. Hanson, Temple City, both of Calif., and Donald E. Knuth, Princeton, N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Aug. 7, 1969, Ser. No. 848,263
Int. Cl. H04l *3/00*
U.S. Cl. 235—155 **35 Claims**

Data processing apparatus for shifting a binary signal coded in a first number base by digits coded in a second number base. A first register stores an operator identifying a shift. A second register stores a scale factor signal identifying the number of required digit shifts. Data processing apparatus is responsive to the stored shift operator and the stored scale factor for shifting the binary signal coded in the



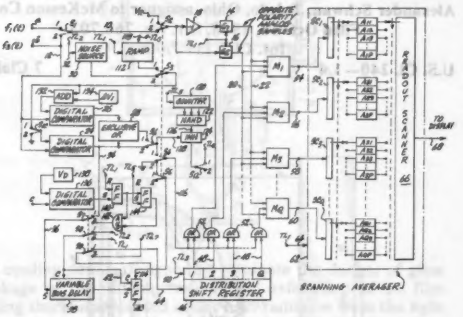
first number base by the number of digits in the second number base identified by the stored scale factor.

3,626,168

MEASURING CORRELATION, AMPLITUDE PROBABILITY AND PROBABILITY DENSITY DISTRIBUTIONS, AND SIGNAL RESPONSE AVERAGING

Keith H. Norsworthy, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed July 7, 1969, Ser. No. 839,340
Int. Cl. G06f *15/34*; **G06g** *7/19*
U.S. Cl. 235—181 **16 Claims**



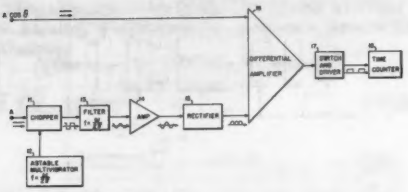
An online real-time instrument for measurement of auto and cross correlation, amplitude probability distribution and amplitude probability density distributions of random analog signals and for measurement of average signal response characteristics. A scanning averager utilized in all the measurements includes capabilities for adapting its time constant to differing clock rates and for selecting its time constant at will for longer and shorter averaging times and for controlling the range of self-adaptivity. The correlation circuitry includes special timing controls for both basic and high frequency modes and combines analog and digital circuit design. The latter is accompanied by provision of a synchronized pseudonrandom noise source to assure uniform probability density distribution for the full scale range of the input signal. Conservation of circuitry is achieved through use of the same circuitry for the different measurements of which the instrument is capable. Special logic is included for enhancement of amplitude probability distribution measurements.

3,626,169

TRIGONOMETRIC ANGLE COMPUTER

Louis R. Rudolph, Annandale, Va., assignor to The United States of America as represented by the Secretary of the Navy

Filed Feb. 5, 1970, Ser. No. 8,796
Int. Cl. G06g 7/22
U.S. Cl. 235—186 4 Claims



Apparatus to calculate an angle θ of a value A cos θ, where A is known. Compare a generated signal A cos ωt with A cos θ in a differential amplifier such that when A cos ωt > A cos θ there is an output pulse on an electronic time counter, the length of the pulse being directly proportional to the angle θ.

ERRATUM

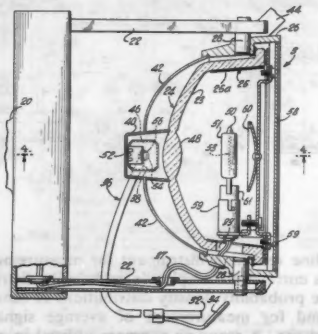
For Class 240—47 see:
Patent No. 3,626,424

3,626,170

DENTAL OR SURGICAL OPERATING LIGHT

Alexander Schwan, Toledo, Ohio, assignor to McKesson Co.

Filed Oct. 18, 1968, Ser. No. 768,703
Int. Cl. F21v 7/00
U.S. Cl. 240—1.4 7 Claims



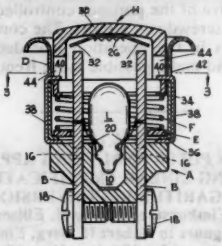
An improved operating light which provides both a general horizontally oriented light pattern of limited vertical and horizontal dimensions for generally illuminating a desired region and an intense but cool source of localized illumination which can be pinpointed in a specified area such as the oral cavity of a patient. The localized illumination is achieved by providing a convex lens in the main reflector of the light, which lens focuses light through a right angle prism onto one end of a fiber-optic bundle, which then transmits the light to the area wherein spot illumination is desired.

3,626,171

ILLUMINABLE PUSHBUTTON SWITCH

Mark H. Abramowitz, Cresskill, and Harry G. Shapiro, Upper Montclair, both of N.J., assignors to Lee Electric, Inc., West New York, N.J.

Filed June 16, 1970, Ser. No. 46,726
Int. Cl. F21v 33/00
U.S. Cl. 240—2 13 Claims



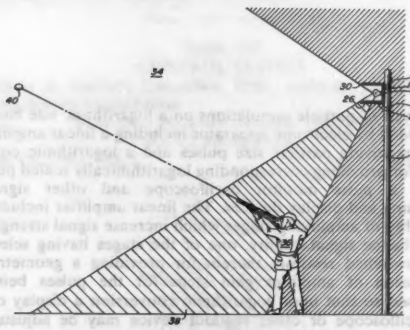
Illuminable pushbutton switch in which the button is guided and retained within a tubular shell by fingers extending from a ring interposed between the shell and a base, the fingers having tips extending transversely through openings in the shell and the button. The contact elements of the switch comprise a simple resilient plate within the button adapted to abut the ends of elongated fixed contacts which also serve as switch terminals.

3,626,172

LIGHTING STRUCTURE FOR NIGHT TRAP SHOOTING AND THE LIKE

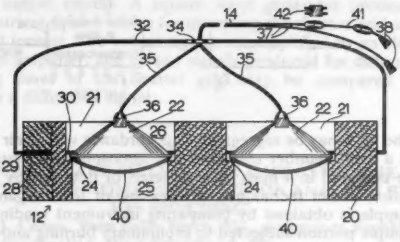
Richard Myszko, 2786 Ater Drive, Xenia, Ohio

Filed Dec. 29, 1969, Ser. No. 888,586
Int. Cl. F21p 1/00
U.S. Cl. 240—3 4 Claims



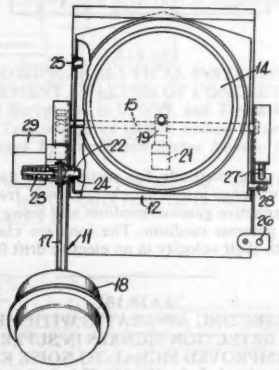
Lighting structure which is particularly adapted for night trap shooting activities or the like. The lighting structure includes a source of light, such as a lamp, or a bulb, or the like. Adjacent the source of light is a panel or the like which includes means for attenuation of light from the lamp, so that attenuated light from the source of light illuminates a region within which a trap shooter is disposed. Other light from the source of light is also permitted to flow without attenuation to a target region within which targets move.
Thus, some of the light rays from the source of light flow directly to a target region, while some of the light rays from the source of light flow through means which greatly reduce the intensity thereof in a region in which a person who shoots the targets is disposed.

3,626,173
FLOAT LIGHT
George H. Harvey, 6408 Thunderbird Drive, Nashville, Tenn.
Filed Nov. 14, 1969, Ser. No. 876,854
Int. Cl. F21v *21/00*
U.S. Cl. 240—26 4 Claims



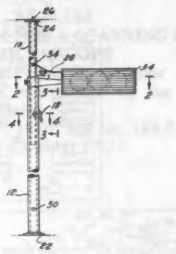
An illuminating device including a floating body and a sealed beam lamp supported face down in the body for projecting a light beam from the bottom of the body. Support means are provided in the body to prevent the lamps from dropping down, and flexible retainer members are provided in the body for lateral movement above the lamp to releasably retain the lamp in place.

3,626,174
HEADLAMP ASSEMBLIES
John Webster Cranmore, Birmingham, England, assignor to Joseph Lucas (Industries) Limited, Birmingham, England
Filed July 24, 1969, Ser. No. 844,288
Claims priority, application Great Britain, Aug. 9, 1968, 38,066/68
Int. Cl. B60q *1/00*
U.S. Cl. 240—7.1 3 Claims



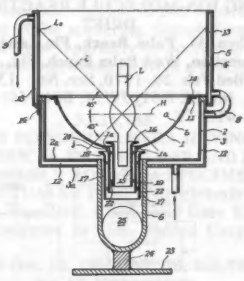
A headlamp assembly for a road vehicle including a support member which is adapted to be secured to the body of a road vehicle, and a headlamp pivotally mounted on the support member for movement between a first inoperative position and a second operative position. In the first inoperative position a part associated with the headlamp constitutes part of the exterior surface of the body of the vehicle, and the headlamp is enclosed by the body of the vehicle. In the second, operative position of the headlamp the optical axis of the headlamp extends generally longitudinally of the vehicle with at least the lens of the headlamp exposed so that the headlamps when energized, illuminates the road in front of the vehicle. Latch means is provided for retaining the headlamp in either of its first or second positions.

3,626,175
ADJUSTABLE LIGHT SYSTEM
Bert Baron, 8023 264th St., Floral Park, N.Y., and Marvin Winter, 214–04 46th Road, Bayside, N.Y.
Filed June 25, 1970, Ser. No. 49,841
Int. Cl. F21v *13/00*
U.S. Cl. 240—41.15 2 Claims



A light having motor means for accurately directing the light beam.

3,626,176
COOLING DEVICE FOR FILM-PROJECTOR LIGHT-UNITS
Taisuke Tsugami, 1-415 Shimoochiai, Shinjuku-ku, Tokyo, Japan
Filed Feb. 9, 1970, Ser. No. 9,649
Int. Cl. F21v *29/00*; G03b *21/18*
U.S. Cl. 240—47 1 Claim

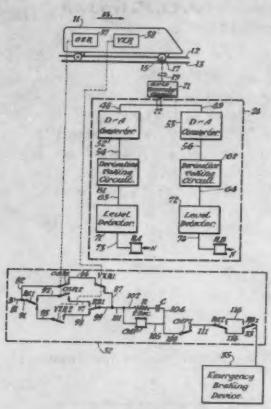


A cooling device designed to eliminate the danger of glass breakage of the reflector mirror and exfoliation of the film coating thereon as caused under heat radiation from the light source such as a xenon lamp. The device includes air-cooling means for the reflector mirror and a double-wall construction of the light-source casing defining water jackets therein. Cooling air supplied to the bottom of the casing is directed through inner and outer concentric annular passages formed in the supply duct and, owing to the particular formation of the outlet ends of the respective air passages, opening close to the central aperture formed in the reflector mirror, flows radially along the inner and outer surfaces of the mirror. Cooling water is supplied to circulate through the water jackets formed in the bottom and sidewalls of the casing.

3,626,177
FAIL-SAFE VEHICLE BRAKE ASSURING
Raymond C. Franke, Glenshaw, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.
Filed May 22, 1970, Ser. No. 39,790
Int. Cl. B60t *13/00*
U.S. Cl. 246—1 9 Claims

This invention relates to a fail-safe vehicle brake assuring circuit for assuring that a vehicle is decelerating at a sufficient rate to a predetermined speed along a predetermined path. The circuit comprises a speed measuring device coupled to the vehicle and electrically coupled to a redundant

channel deceleration detection network, which is, in turn coupled to an interlocking circuit having an output. The interlocking circuit also receives a vehicle overspeed signal input and a zero velocity input signal. The absence of an output signal on the output of the interlocking circuit is indicative of insufficient vehicle deceleration or of any speed condition coupled with a component failure in the brake assuring circuit.

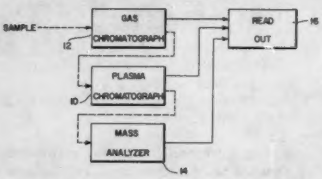


3,626,178

GAS OR LIQUID CHROMATOGRAPH WITH DETECTOR EMPLOYING ION-MOLECULE REACTIONS AND ION DRIFT

Martin J. Cohen, W. Palm Beach, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Feb. 20, 1970, Ser. No. 13,030
Int. Cl. H01j *39/34*; B01d *59/44*
U.S. Cl. 250—41.9 TF **23 Claims**



Components of the effluent of a gas or liquid chromatograph are detected by reacting molecules of the components with primary ions to produce secondary ions which may be segregated in accordance with their drift velocity in a drift field. In certain embodiments, the ions are analyzed in a mass spectrometer, which may include an electron multiplier coupled to a signal averaging computer. Molecular and/or ionic concentrators may be employed to increase the concentration of the sample, and liquid samples may be analyzed after preliminary vaporization. Ion formation and drift take place under atmospheric or higher pressure conditions, while mass analysis is performed under high-vacuum conditions.

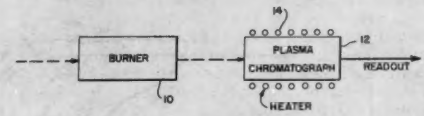
3,626,179

HIGH TEMPERATURE METHOD AND APPARATUS FOR ANALYZING GASEOUS SAMPLES

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Apr. 3, 1970, Ser. No. 25,516
Int. Cl. H01j *39/34*; B01d *59/44*
U.S. Cl. 250—41.9 TF **20 Claims**

Analysis of gaseous samples containing inorganic trace substances which may be accompanied by organic interferents. The sample is passed through a high temperature pyrolizer or oxidizing burner to convert the complex organic materials to more simple organic materials or inorganic products of combustion. Components of the effluent of the burner are involved in ion-molecule reactions, which produce secondary ions that may be detected and measured.



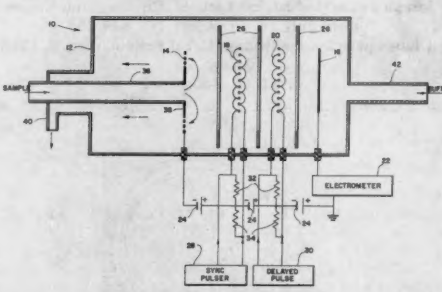
The ions may be segregated in accordance with their velocity in a drift chamber maintained at atmospheric pressure, may be analyzed in a mass spectrometer, or detected by condensation nuclei techniques. A measure of total organics in a sample is obtained by comparing instrument readings for a sample portion subjected to preliminary burning and another sample portion analyzed without preliminary burning.

3,626,180

APPARATUS AND METHODS FOR SEPARATING, DETECTING, AND MEASURING TRACE GASES WITH ENHANCED RESOLUTION

David I. Carroll, Lantana; Martin J. Cohen, West Palm Beach, and Roger F. Wernlund, Lake Worth, all of Fla., assignors to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Dec. 3, 1968, Ser. No. 780,851
Int. Cl. H01j *39/34*
U.S. Cl. 250—41.9 TF **22 Claims**



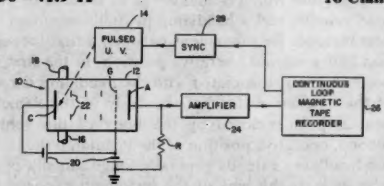
Apparatus and methods for sorting and detecting trace gases which undergo ion-molecule reactions, trace ions being formed in a reactive gaseous medium and being analyzed in a nonreactive gaseous medium. The ions are classified in accordance with their velocity in an electric drift field.

3,626,181

GAS DETECTING APPARATUS WITH MEANS TO RECORD DETECTION SIGNALS IN SUPERPOSITION FOR IMPROVED SIGNAL-TO-NOISE RATIOS

Roger F. Wernlund, Lake Worth, Fla., assignor to Franklin GNO Corporation, West Palm Beach, Fla.

Filed Feb. 11, 1969, Ser. No. 798,399
Int. Cl. H01j *39/34*; B01d *59/44*
U.S. Cl. 250—41.9 TF **16 Claims**



Ions produced from a gaseous sample, including ions of trace gases to be detected, are separated in a drift cell in ac-

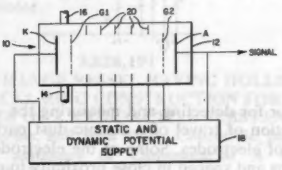
cordance with their velocity in an electric drift field and produce output currents which vary as a function of real time. In one embodiment a passive grid shields the output circuit from ion displacement currents, and the output signals are recorded on a continuous loop magnetic tape recorder synchronized with the production of the ions. In another embodiment an active shutter grid ion gate is opened at a predetermined time after the production of the ions and passes all ions with velocity less than a predetermined value to the output circuit. A square wave generator produces asymmetrical square waves for operating the shutter grid and a pulsed ionizer. The output signals are amplified by an electrometer amplifier, and output signals produced for different opening times of the shutter grid may be compared to produce a difference signal.

3,626,182

APPARATUS AND METHOD FOR IMPROVING THE SENSITIVITY OF TIME OF FLIGHT ION ANALYSIS BY ION BUNCHING

Martin J. Cohen, West Palm Beach, Fla., assignor to Franklin GND Corporation, West Palm Beach, Fla.

Filed Apr. 1, 1969, Ser. No. 812,284
Int. Cl. H01j *39/34*; B01d *59/44*
U.S. Cl. 250—41.9 TF **15 Claims**



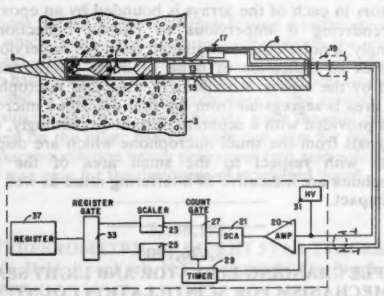
Apparatus and methods for sorting and detecting ions in a drift cell, the electric fields applied to different regions of the cell being controlled at appropriate times to ensure the rapid withdrawal of the ions from a reaction region to an analysis region, the bunching of the ions in the analysis region, and thereafter the separation of the bunched ions in accordance with ion drift velocity, and detection of separated ion species.

3,626,183

RADIOISOTOPE ANALYTICAL INSTRUMENT FOR CEMENT ANALYSIS OF CONCRETE

Peter Francis Berry; James D. Hall, and Tomihiko Furuta, all of Austin, Tex., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed July 15, 1970, Ser. No. 54,951
Int. Cl. G01t *1/20*; G01n *23/10*
U.S. Cl. 250—43.5 D **10 Claims**



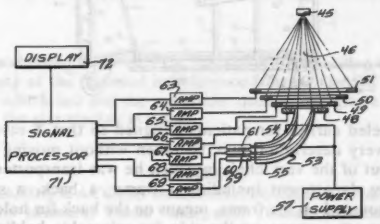
A portable radioisotope instrument has been developed for field cement analysis yielding an accuracy of 1 to 2 percent cement in wet concrete. The instrument consists essentially of a cylindrical depth probe unit in which a pair of γ-ray sources of different energy and a detector are arranged in coaxial alignment and the output of the detector is coupled to a portable scaler. The detector is shielded from the source so that only the γ-backscattered radiation is detected and through proper calibration of the device as to the aggregate type the operator can radially analyze a wet mix by inserting the probe into the mix and measure the two radiation intensities with reference to the proper calibration curve to determine the cement content.

3,626,184

DETECTOR SYSTEM FOR A SCANNING ELECTRON MICROSCOPE

Albert V. Crewe, Palos Park, Ill., assignor to The United States of America as represented by the United States Atomic Energy Commission

Filed Mar. 5, 1970, Ser. No. 168,020
Int. Cl. H01j *37/28*
U.S. Cl. 250—49.5 A **7 Claims**



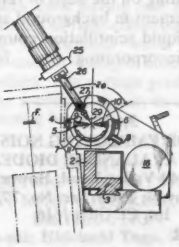
In an electron microscope transmitted electrons are detected according to whether they are unscattered, elastically scattered or inelastically scattered by the specimen. The elastically scattered electrons are further separated according to the magnitude of the scattering. Signals from the separate detectors can be used separately or combined as desired to enhance the information obtained from a specimen.

3,626,185

X-RAY POWDER CAMERA HAVING A SEMICYLINDRICAL FILM HOLDER AND MEANS TO SIMULTANEOUSLY ROTATE A SPECIMEN ABOUT TWO MUTUALLY PERPENDICULAR AXES

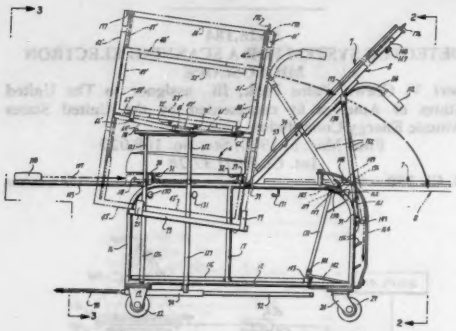
William Parrish, Stamford, Conn., and Imre E. Vajda, Yonkers, N.Y., assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 10, 1968, Ser. No. 766,585
Int. Cl. G01n *23/20*
U.S. Cl. 250—51.5 **5 Claims**



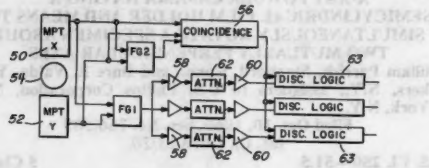
A camera for X-ray diffraction studies of small single crystal or polycrystalline specimens is disclosed. The camera provides a means of accurately centering the specimen, a collimator and a semicylindrical film mount. The specimen is simultaneously rotated around its mounting axis and pivoted around the camera axis to provide an X-ray powder photograph.

3,626,186
MOBILE X-RAY CHAIR
Charles D. Allard, 1620 Hickory Ave., San Leandro, Calif., and Eugene R. Allard, 1809 A Pearl, Alameda, Calif.
Filed Oct. 3, 1969, Ser. No. 863,649
Int. Cl. G01n 23/04
U.S. Cl. 250—50 5 Claims



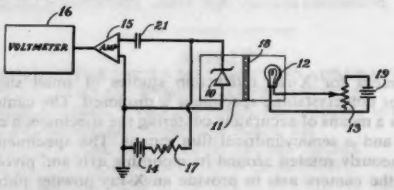
A wheeled carrier for patients designed so that X-rays of almost every description may be taken without moving the patient out of the very chair in which he was transported to the X-ray department including a frame, a back, a seat, wheels mounted on the frame, means on the back for holding a film cassette, means on the side for releasably holding a film cassette, and means on the other side for releasably holding a film cassette.

3,626,187
PULSE-HEIGHT ANALYSIS IN SCINTILLATION COUNTING
Barton H. Laney, Deerfield, Ill., assignor to Nuclear-Chicago Corporation, Des Plaines, Ill.
Filed Jan. 21, 1969, Ser. No. 792,717
Int. Cl. G01t 1/20
U.S. Cl. 250—71.5 R 31 Claims



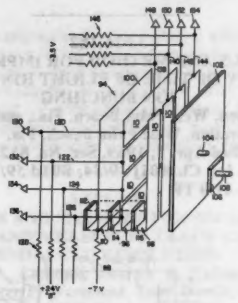
Coincident output pulses of a plurality of photomultipliers are selected for counting on the basis of relative amplitude as well as sum. Improvement in background and isotope resolution is obtained in liquid scintillation counting. Pulse-height analysis circuits incorporating the improvement are described.

3,626,188
LIGHT DETECTOR EMPLOYING NOISE QUENCHING OF AVALANCHE DIODES
George E. Chilton, 144 Valley Road, Haworth, N.J.
Filed Nov. 4, 1968, Ser. No. 773,141
Int. Cl. G01t 1/16
U.S. Cl. 250—83.3 R 2 Claims



The semiconductor diode devices are operated in an avalanche mode. The diode is subjected to external light energy. The degree of the resulting reduction in noise is a function of the light intensity.

3,626,189
COSMIC DUST SENSOR
Otto E. Berg, Forest Heights, Md., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration
Filed Dec. 31, 1968, Ser. No. 789,044
Int. Cl. G01t 1/18
U.S. Cl. 250—83.6 R 15 Claims

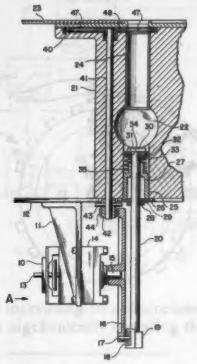


A sensor for detecting and measuring the energy, velocity and direction of travel of a cosmic dust particle, comprises an array of electrodes. Some of the electrodes are arranged in columns and spaced in close proximity to other electrodes that are disposed in rows. Together the columns and rows define a plurality of sectors through which a cosmic particle may traverse. Each electrode includes electrically biased conductor layers supported on an optically transparent matrix. Ions and electrons from an impacting cosmic dust particle compose an ionized plasma for collection on the electrically biased conductors, creating an electrical output pulse which may be amplified. A second array of electrodes in columns and grids in rows is included in spaced relationship from the first array. An impacting cosmic dust particle on the second array produces an electrical output pulse in the same manner as described. Should a particle penetrate the first array and impact upon the second spaced array, a pair of time spaced electrical outputs will result, the time spacing of the pulses being proportional to the velocity of the particle. The direction of the particle's travel, and thereby its origin in space is determined by the alignment of respective sectors traversed by the particle. Behind the second array is placed a microphone plate which arrests further penetration of the particle. The microphone output amplitude is an indication of the momentum of a particle. At least one of the secottors in each of the arrays is bounded by an epoxy coating rendering it impervious to plasma collection. Accordingly, a pulse output originated from the impervious sector gives an indication of noise or other interference collected by the sensor. Additionally, a second microphone of small area is segregated from the first-described microphone and is provided with a separate output. Accordingly, electrical signals from the small microphone which are disproportionate with respect to the small area of the second microphone are indicative of interfering noise as well as particle impact.

3,626,190
SAMPLE CHANGING ELEVATOR AND LIGHT SEALING MECHANISM FOR SCINTILLATION COUNTING
Raymond E. Cannon, San Diego, Calif., assignor to Beckman Instruments, Inc.
Filed Apr. 11, 1966, Ser. No. 541,654
Int. Cl. G01t 1/20, 7/02
U.S. Cl. 250—106 14 Claims

Describes a sample handling system for a liquid scintillation counter or the like having a sinusoidal drive for a sample changer elevator with a positively interlocked upper shutter

mechanism and a cooperating lower light seal carried by the elevator which overlaps the lower end of the elevator passage



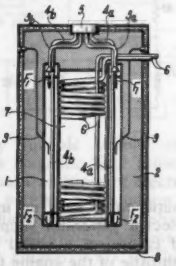
while the shutter is open. The mechanism is driven by a unidirectional motor.

3,626,191

ION EXCHANGE VESSEL HAVING HOLLOW CYLINDRICAL RING CONSTRUCTION FOR THE TRANSFER OF A RADIOACTIVE SUBSTANCE

Rene Antony Pierlas, and Jean Marie Courouble, both of Orsay, France, assignors to Commissariat A L'Energie Atomique, Paris, France

Filed Feb. 20, 1969, Ser. No. 801,093
Claims priority, application France, Feb. 28, 1968, 141696
Int. Cl. G21f 5/02; G21h 5/00
U.S. Cl. 250—108 R 5 Claims



A vessel for the purpose of transferring a radioactive substance which is adsorbed on an ion exchanger in the granular state, said vessel being characterized in that it comprises on the one hand a column in the form of a cylindrical ring which is intended to contain an ion exchanger in the granular state and is surrounded by a shield having good thermal conductivity and on the other hand at least one pipe for the supply of radioactive solution which penetrates into said column and at least one pipe for the discharge of irradiated liquid.

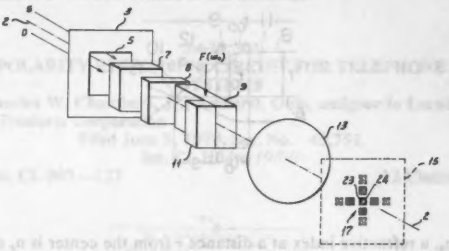
3,626,192

INTERFEROMETRIC DAYLIGHT STAR TRACKER

Daniel N. Held, New York, N.Y., assignor to The Bendix Corporation

Filed Aug. 15, 1969, Ser. No. 850,552
Int. Cl. G01c 3/08; H01j 39/12; G01b 11/26
U.S. Cl. 250—203 13 Claims

A star tracker having an aperture for receiving and diffracting starlight and daylight. Interference fringes are formed form the starlight because of its coherent nature. A phase shifter is positioned to intercept a portion of the diffracted light and phase shift the intercepted light in response to a signal causing the interference fringes to be modulated in accordance with the signal. Photodetectors sense the fringe modulation and provide modulated outputs which are



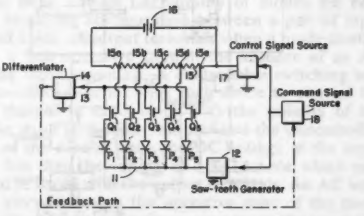
demodulated to provide DC voltages corresponding to the intensity of the detected interference fringes. The DC voltages are subtracted and the remainder used to energize a servo to aim the star tracker at a star.

3,626,193

RANDOM ACCESS SOLID-STATE IMAGE SCANNER

Yasuo Ishihara; Takao Ando, and Tukasa Akahoshi, all of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan

Filed July 22, 1970, Ser. No. 57,291
Claims priority, application Japan, July 29, 1969, 44/60242
Int. Cl. H01j 39/12
U.S. Cl. 250—209 14 Claims



An image scanner adapted for random-access and semirandom-access scanning (of a document, e.g.) comprises an array of photodiodes each having one terminal respectively connected to a plurality of field-effect transistors and another terminal receiving a sawtooth wave. The gates of the transistors receive control voltages according to a predetermined voltage gradient. The voltage gradient is in turn selectively controlled by a control signal, to thereby establish the point at which scanning begins.

3,626,194

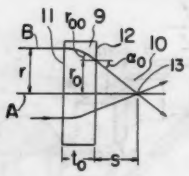
PHOTOELECTRIC CONVERTER INCLUDING CONVERGENT LENS WITH REFRACTIVE INDEX DISTRIBUTION

Jiro Hirano, Kobe-shi; Hidetoshi Togo, Itami-shi, and Katsuhiko Nishida, Tokyo-to, all of Japan, assignors to Nippon Selfoc Kabushiki Kaisha, also known as Nippon Silfoc Co., Ltd., Tokyo-to, Japan

Filed Aug. 26, 1969, Ser. No. 853,118
Claims priority, application Japan, Aug. 30, 1968, 43/62607
Int. Cl. G02b 5/14
U.S. Cl. 250—216 10 Claims

Disclosed herein is a photoelectric converter including a convergent lens with a transparent member having a refractive index distribution, in a cross section perpendicular to a travelling axis of light, so as to substantially satisfy the equation:

$n_r=n_a(1-ar^2)$
when a refractive index at the center of the cross section is



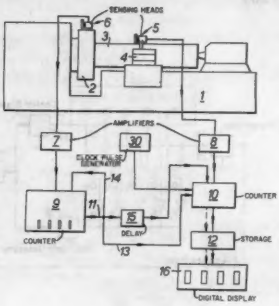
n_a, a refractive index at a distance r from the center is n_r and a positive constant is a.

3,626,195

RADIATION SENSITIVE APPARATUS FOR MEASURING WORKPIECES

Antony Brian Fitzjohn; Ian Thompson, and Anthony Wilson, all of Sheffield, England, assignors to British Steel Corporation, London, England

Filed July 14, 1970, Ser. No. 54,740
Claims priority, application Great Britain, July 23, 1969, 37,018/69
Int. Cl. G01b 7/12
U.S. Cl. 250—219 S **11 Claims**



Apparatus for measuring a diameter of a workpiece comprises two sensors each of which has a wheel and a pulse generator controlled by the wheel. The wheel on one sensor makes contact with a portion of the workpiece the diameter of which is to be measured and the wheel on the other sensor makes contact with a reference body of known diameter rotatable in synchronism with the workpiece, e.g. a chuck or faceplate. Counter circuitry is provided which is responsive to the outputs from the pulse generators and is operative to determine the ratio of these outputs whereby, knowing the diameter of the reference body, the diameter of the workpiece can be derived therefrom.

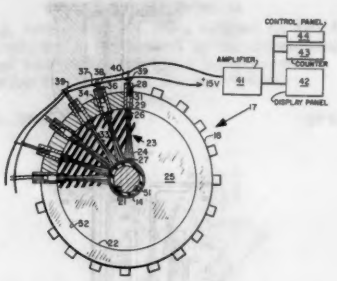
3,626,196

RADIATION SENSITIVE HOLIDAY DETECTOR FOR COATED STRANDS

Edwin H. Arnaudin, Jr., Marion; Wilbert H. Christiansen, Indianapolis, and Robert M. Hazelett, Jr., Marion, all of Ind., assignors to Anaconda Wire and Cable Company

Filed Nov. 4, 1969, Ser. No. 873,811
Int. Cl. G01n 21/32
U.S. Cl. 250—219 S **6 Claims**

An apparatus for the detection of holidays in the wall of a coating on a curved elongated surface, such as that of an electrical conductor strand, employs light-transmitting fibers,



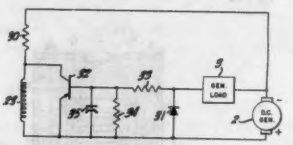
distributed around the strand, to transmit both the illumination and the reflected light.

3,626,197

MOTOR GENERATOR WITH AUTOMATIC SPEED AND IDLING CONTROL

Anthony Zanzarella, Ardsley, N.Y., and Joseph B. Gag, Stamford, Conn., assignor Textron Inc., Providence, R.I.

Filed July 30, 1970, Ser. No. 59,578
Int. Cl. H02p 9/04
U.S. Cl. 290—40 C **9 Claims**



An automatic control for an internal combustion engine driving an electric generator supplying a variable and intermittent load comprises a speed responsive governor controlling the throttle of the engine to maintain it at a constant operating speed as long as there is load on the generator regardless of the amount of load and an automatic override which reduces the engine speed to a selected idling speed when there is no load on the generator.

ERRATUM

For Class 307—262 see:
Patent No. 3,626,425

3,626,198

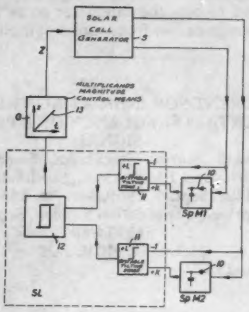
PROCESS AND APPARATUS FOR OPTIMIZING THE PRODUCT OF TWO PHYSICAL MAGNITUDES

Andreas Boehringer, Friedrichshafen, Germany, assignor to Dornier System GmbH, Friedrichshafen, Germany

Filed Sept. 24, 1969, Ser. No. 860,653
Claims priority, application Germany, Oct. 19, 1968, P 18 04 130.0
Int. Cl. H02j 1/10
U.S. Cl. 307—52 **9 Claims**

The product of the two interdependent physical magnitudes is regulated by comparing measured instantaneous values of each magnitude in alternating manner with a stored part value of a previously measured peak value of the same

magnitude and of switching over the magnitude from a decreasing to an increasing value while reversing the other magnitude from an increasing to a decreasing value upon the instantaneous value algebraically equaling the stored value.

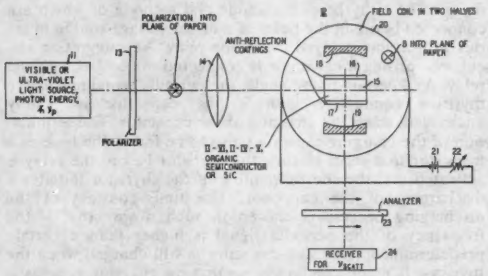


3,626,199

TUNABLE VISIBLE OR ULTRAVIOLET FREQUENCY SHIFTER

Paul Aime V. Fleury, Middletown, and James Floyd Scott, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 1, 1970, Ser. No. 41,922
Int. Cl. H03f 7/04
U.S. Cl. 307—88.3 **7 Claims**


VISIBLE OR ULTRA-VIOLET LIGHT SOURCE, PHOTON ENERGY, $h\nu_p$
POLARIZATION INTO PLANE OF PAPER
POLARIZER
ANTI-REFLECTION COATINGS
FIELD COIL IN TWO HALVES
B INTO PLANE OF PAPER
II-VI, II-IV-V, ORGANIC SEMICONDUCTOR OR SiC
ANALYZER
RECEIVER FOR ν_{SCATT}

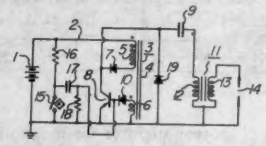
The disclosed broadly tunable visible or ultraviolet frequency shifter employs magnetic field tuning of Raman scattering from spin-reversal transitions of electrons or holes in semiconductors having parabolic conduction bands. Such frequency shifting is achieved in semiconductors having bandgaps in the visible and ultraviolet portions of the spectrum. The semiconductors employed are II–VI semiconductors, II–IV–V semiconductors, silicon carbide and organic semiconductors. The pumping light preferably has a frequency just below the bandgap frequency of the semiconductor.

3,626,200

ELECTRIC PULSE GENERATOR MEANS

Takao Sasayama, Hitachi-shi, Japan, assignor to Hitachi, Ltd., Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,327
Claims priority, application Japan, Oct. 2, 1968, 43/71122
Int. Cl. H03k 3/00; F02p 1/00
U.S. Cl. 307—106 **22 Claims**



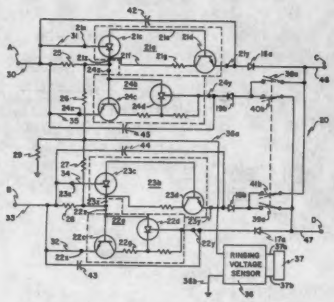
A closed series circuit is composed of a plurality of circuit elements, i.e. a DC current source, an inductive reactor, a transistor. The conduction of the transistor is chosen to take place for a predetermined interval at a predetermined frequency. A capacitor is provided for being charged by a voltage induced across the inductive reactor at the time of the cutoff of the transistor. And the charge stored in the capacitor is discharged to a load simultaneously with the initiation of the conduction of the transistor.

3,626,201

POLARITY RESPONSIVE CIRCUIT FOR TELEPHONE SYSTEMS

Charles W. Chambers, Jr., Amherst, Ohio, assignor to Lorain Products Corporation

Filed June 5, 1970, Ser. No. 43,751
Int. Cl. H04m 19/00
U.S. Cl. 307—127 **12 Claims**



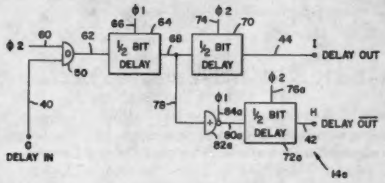
A circuit for providing a unidirectional DC output voltage from a reversible DC input voltage (for example, talking power in a telephone circuit) and for providing an AC output voltage (for example, ringing power in a telephone circuit) from an AC input voltage. A plurality of diodes are connected in a rectifying configuration between a pair of input terminals and a pair of output terminals when a mode control circuit is in a first operative state in the absence of an AC voltage at the input terminals. A controllable switching network is connected in series with each diode to control the conduction thereof in accordance with the polarity of the voltage at the input terminals. This prevents the uncontrolled conduction of the diodes when the DC voltage at the input terminals is less than the voltage of a DC source which may be connected in series with the output terminals. An AC voltage sensing circuit changes the operative state of the mode control circuit when an AC voltage appears at the input terminals. This change in state causes the mode control circuit to reconnect the diodes in a nonrectifying configuration between the input and output terminals and thereby permit the free flow of an AC current therebetween.

3,626,202

LOGIC CIRCUIT

Alan E. Pound, Sunnyvale, Calif., assignor to American Micro-Systems, Inc., Santa Clara, Calif.

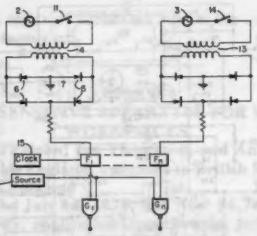
Original application Aug. 23, 1967, Ser. No. 662,761, now abandoned. Divided and this application July 13, 1970, Ser. No. 61,028
Int. Cl. H03k 19/08
U.S. Cl. 307—208 **6 Claims**



A logic circuit is disclosed comprised of two separate but connectable sections, namely a complex gate section and a

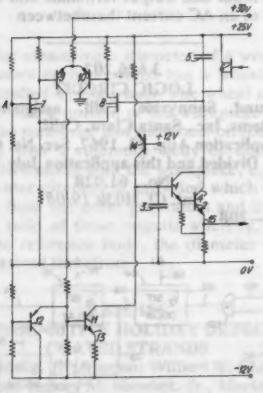
delay section. The gate section has five input terminals for receiving data and/or control input signals and a single output, the delay section having a single input and two outputs providing a one-bit delay output and a complemented one-bit delay. By means of various interconnections the circuit can provide a wide range of functional devices including various flip-flop arrangements with clear and load capabilities.

3,626,203
MECHANICAL SWITCH INTERFACE
Peter G. Bartlett, Davenport, Iowa, assignor to Struthers-Dunn, Inc., Pitman, N.J.
Filed June 11, 1970, Ser. No. 45,384
Int. Cl. H03k *19/12*
U.S. Cl. 307—208 **3 Claims**



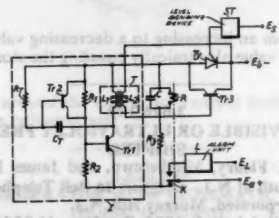
An interface is provided to allow signals from a relatively low-speed mechanical or electromechanical system to be used in a high-speed electronic system. Each of the input signals is fed to a rectifying circuit and then the signal is transmitted to a gated flip-flop. The output of the gated flip-flop is coupled with an inhibiting signal and applied to an output inverter. The output is a high-speed, small rise-time signal usable in electronic computing or control systems.

3,626,204
FREQUENCY-BIASED RATEMETER
Martin Brandon, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Mar. 27, 1970, Ser. No. 23,135
Claims priority, application Great Britain, Apr. 23, 1969, 20,646/69
Int. Cl. H03d *13/00*
U.S. Cl. 307—233 **9 Claims**



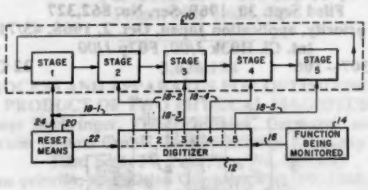
A frequency-biased ratemeter or frequency-to-voltage converter wherein a capacitor is continuously charged at a first constant rate and discharged at a second constant rate for a period of time which is determined by the frequency of an input pulse signal. The ratio of charge time to discharge time can be altered to bias the ratemeter so as to make it more responsive to high or low frequencies of input signal.

3,626,205
ARRANGEMENT FOR INDICATING THE EXCEEDING OF A CERTAIN FREQUENCY OF A PERIODICAL SIGNAL
Heinrich Rudolf Sturm, Stockholm, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden
Filed Sept. 4, 1969, Ser. No. 855,333
Claims priority, application Sweden, Sept. 26, 1968, 12974/68
Int. Cl. H03k *5/20*
U.S. Cl. 307—233 **4 Claims**



An arrangement for indicating when a periodic signal exceeds a certain frequency. The periodic signal is supplied to the gate of a thyristor, the anode and cathode of which are connected between the poles of a direct voltage source in series with a time delayed indication relay. An integration circuit comprising a capacitor is connected in parallel with the relay. At a certain phase angle, the periodic signal makes the thyristor conductive and, if the capacitor is mainly uncharged, starts the charging of the capacitor. The termination of the charging causes a pulse to be fed to the base of a transistor that short circuits the thyristor before the relay is activated and the short-circuiting of the thyristor initiates a discharging of the capacitor. The time constant of the discharging process is chosen in such a way that if the frequency of the periodic signal is higher than a certain predetermined value, the capacitor is still charged when the thyristor is made conductive so that no charging process is started and consequently no pulse is supplied to the transistor and the indication relay is activated.

3,626,206
CIRCUIT MEANS FOR CYCLICALLY MONITORING AND INDICATING THE CONDITION OF A FUNCTION
Russel T. Stebbins, Mountain View, Calif., assignor to Itek Corporation, Lexington, Mass.
Continuation of application Ser. No. 690,647, Dec. 14, 1967, now abandoned. This application Sept. 16, 1970, Ser. No. 72,897
Int. Cl. H03k *5/20*
U.S. Cl. 307—235 **13 Claims**



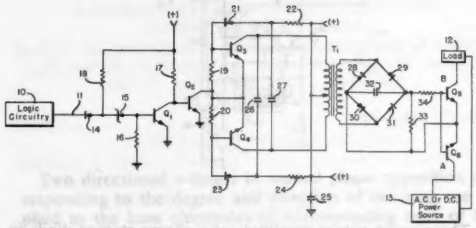
A stepping chain-type digitizer for monitoring the condition of a function and for converting the condition into true and false conditions of the steps of the chain whereby any change of the monitored condition produces a change in the condition of the steps. The steps of the stepping chain are

utilized to control inhibitor gates placed in the stages of the normally free-running ring counter. Any stage of the ring counter controlled by a step in a selected condition remains in the "on" position after the counter advances to turn it "on," and thereby stops any further advance of the ring counter. The stage of the ring counter which remains locked in the "on" position provides the indication of the condition of the monitored function.

3,626,207
SOLID-STATE POWER SWITCH

Peter G. Bartlett, Davenport, Iowa, assignor to Struthers-Dunn, Inc., Pitman, N.J.

Filed June 5, 1970, Ser. No. 43,877
Int. Cl. H03k *17/66*
U.S. Cl. 307—250 **1 Claim**

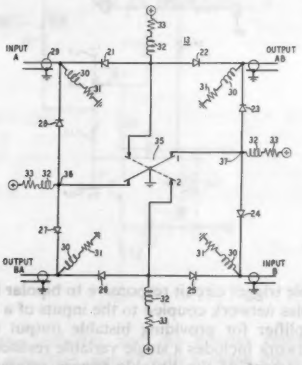


A solid-state, power-switch for selectively controlling the energization of a load with either alternating or direct current in response to a low-level signal. The switch comprises an amplifier, an oscillator, a rectifier for converting the output of the oscillator to a direct current signal, and a pair of interconnected power transistors connected in series with the load and the alternating or direct current power supply, and with the latter transistors being responsive to the output of the rectifier to permit a flow of current from the power supply to the load irrespective of the instantaneous polarity of the power supply.

3,626,208
DOUBLE-POLE DOUBLE-THROW DIODE SWITCH

Richard T. Cooney, Salem, N.H., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Oct. 21, 1969, Ser. No. 868,010
Int. Cl. H03k *17/74*
U.S. Cl. 307—257 **6 Claims**

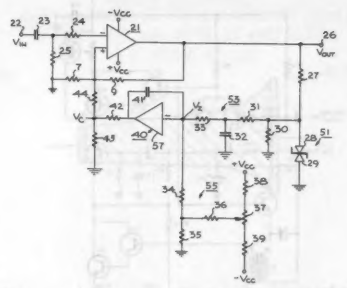


A reversing gate that allows the exchange of two radio frequency signal inputs between each of two outputs in response to a direct current switch command. Eight diodes are arranged in pairs in a bridge so that the ON pairs back bias OFF pairs thus simplifying the driving currents required. A plurality of gates can be compounded to achieve more complicated switching functions.

3,626,209
SQUARE WAVE GENERATING CIRCUIT

Robert E. Chandos, Santa Barbara, Calif., assignor to Electro-Optical Industries, Inc.

Filed Apr. 6, 1970, Ser. No. 26,038
Int. Cl. H03k *5/00*
U.S. Cl. 307—268 **9 Claims**

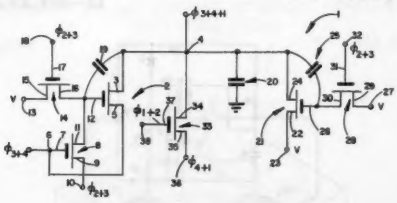


A square wave generating circuit for automatically deriving a 50—50 square wave output signal of constant amplitude from a random but repetitive input signal. An operational amplifier utilized as a Schmitt trigger converts the input signal into a rectangular output waveform which is clipped by a back-to-back zener diode arrangement and fed to an operational integrator. The output of the operational integrator controls the threshold levels of the Schmitt trigger in response to the duty cycle of the Schmitt trigger output signal in order to produce a square waveform output from the Schmitt trigger.

3,626,210
THREE-PHASE CLOCK SIGNAL GENERATOR USING TWO-PHASE CLOCK SIGNALS

John R. Spence, Villa Park, Calif., assignor to North American Rockwell Corporation

Filed June 25, 1970, Ser. No. 49,885
Int. Cl. H03k *17/60*
U.S. Cl. 307—269 **5 Claims**



A first bootstrapped field effect transistor drives the output to a true voltage level during a first phase of a (two-phase) multiple phase clocking scheme. A second bootstrapped field effect transistor, turned on when the output was driven true, remains on for a second consecutive phase for maintaining the true voltage level at the output. During a third consecutive phase, a third field effect transistor is turned on. The second and third field effect transistors maintain the output at said true voltage level during the third consecutive phase. The third field effect transistor drives the output to a false voltage level during a fourth consecutive phase. Thereafter

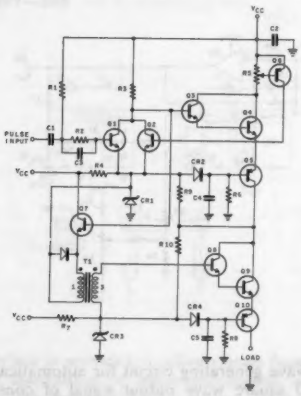
the cycle is repeated. The field effect transistors comprising the generator are gated by the major (double width, or two-phase) clock signals which have overlapping phases.

3,626,211

PULSE MODULATOR

Richard B. Formeister, Phoenix, Ariz., assignor to Sperry Rand Corporation

Filed Dec. 16, 1970, Ser. No. 98,519
Int. Cl. H03k *1/14, 5/08, 6/02*
U.S. Cl. 307—270 **11 Claims**



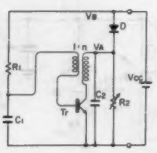
High-speed high-current low-voltage elements are used to generate high-speed high-current pulses having an amplitude approaching twice the breakdown voltage rating of the active elements. A plurality of circuits may be stacked to provide absolute pulse amplitudes that are multiples of the active element breakdown voltage rating. The circuit may also be prebiased at a level independent of the active element voltage rating.

3,626,212

PULSE GENERATING CIRCUIT

Fumio Watase, Tokyo, Japan, assignor to Tohoku Oki Electric Company

Filed Oct. 18, 1967, Ser. No. 676,178
Claims priority, application Japan, Oct. 14, 1966, 41/70094
Int. Cl. H03k *3/30*
U.S. Cl. 307—275 **1 Claim**



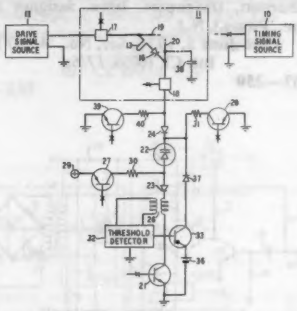
A pulse generating circuit such as a monostable multivibrator, an astable multivibrator and a blocking oscillator is comprised by a first and second transistors, a source of current energizing collector electrodes of transistors and a temperature sensitive element serially connected with the collector resistors and the difference between the voltage drop across the temperature sensitive element response to the variation in the ambient temperature and the source voltage is applied to the base and collector resistors.

3,626,213

CIRCUIT EMPLOYING CHARGE STORAGE DIODE IN FAST DISCHARGE MODE

Sigurd G. Waaben, Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Dec. 4, 1968, Ser. No. 781,167
Int. Cl. H03k *3/26, 17/74*
U.S. Cl. 307—281 **6 Claims**



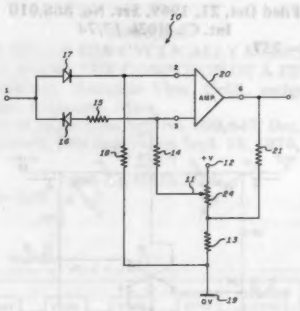
The current output amplitude of a charge storage diode in its reverse conducting condition is absolutely limited by detecting the attainment of a predetermined output level and in response thereto applying an aiding feedback to the diode to terminate the current rapidly by purging the remaining carriers at a much faster rate. This mode of diode operation is employed with current detection in a memory drive circuit. One aspect of the fast diode discharge mode is also employed in a time shared sample and hold circuit.

3,626,214

BIPOLAR INPUT BISTABLE OUTPUT TRIGGER CIRCUIT

Charles R. Wesner, Crozet, Va., assignor to Sperry Rand Corporation, Great Neck, N.Y.

Filed Mar. 3, 1970, Ser. No. 16,118
Int. Cl. H03k *3/15*
U.S. Cl. 307—290 **5 Claims**



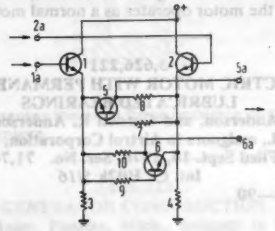
A bistable trigger circuit responsive to bipolar input signals having a bias network coupled to the inputs of a basic operational amplifier for providing bistable output signals. The biasing network includes a single variable resistor which provides adjustment of the bistable trigger reference voltage. The output of the operational amplifier changes state for positive or negative variations of the bipolar input signal, greater or less than the preset value of the variable reference voltage.

3,626,215

CIRCUIT ARRANGEMENT FOR AUTOMATIC ELECTRONIC FREQUENCY TRIMMING IN A RECEIVER

Eckart Schatter, Munich, Germany; Hans Ulrich Renk, deceased, late of Munich, Germany; Johanna Elisabeth Renk, nee Johnel, Wurzburg; Sibylle Freia Bergmann, nee Renk, New-Isenberg-Gravenbruch, and Ingo Wolfram Renk, heirs, Frankfurt am main, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Germany

Filed Aug. 24, 1970, Ser. No. 66,539
Claims priority, application Germany, Aug. 28, 1969, P 19 43 819.8
Int. Cl. H03k 1/16
U.S. Cl. 307—295 **4 Claims**



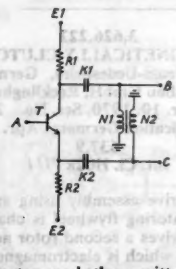
Two directional voltages in mutual phase opposition corresponding to the degree and direction of detuning are applied to the base electrodes of corresponding ones of first and second input transistors. Each of the first and second input transistors has a collector electrode connected to a source of supply voltage and an emitter electrode connected to a source of reference voltage via a corresponding one of a pair of ohmic emitter resistors. First and second output transistors are connected in parallel with each other in opposite conductance directions between the emitter electrodes of the input transistors. Each of the first and second output transistors has an emitter electrode directly connected to the emitter electrode of a corresponding one of the input transistors, a collector electrode connected to the emitter electrode of a corresponding one of the input transistors via a corresponding one of one of two pairs of ohmic resistors and a base electrode connected to the emitter electrode of a corresponding one of the input transistors via a corresponding one of the other of the two pairs of ohmic resistors. An output magnitude corresponding to the trimming voltage is derived from the collector electrodes of the output transistors.

3,626,216

PHASE SHIFTING CIRCUIT

Tage Ake Siverth Bergman, Partille, Sweden, assignor to Telefonaktiebolaget LM Ericsson, Stockholm, Sweden

Filed Apr. 14, 1969, Ser. No. 815,872
Claims priority, application Sweden, May 22, 1968, 6924/68
Int. Cl. H03f 3/26
U.S. Cl. 307—295 **1 Claim**



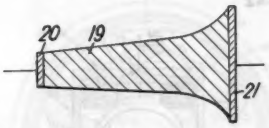
From the collector and the emitter respectively of a transistor amplifier, signals with a phase difference of 180° are obtained. Upon increasing frequency the phase difference decreases due to the frequency dependence of the parameters of the transistor. By connecting the respective windings of a transformer between ground potential and the collector and the emitter respectively of a transistor amplifier, output signals with a phase difference of 180° over a wide frequency range will be obtained.

3,626,217

SOLID-STATE CODERS

Carl Peter Sandbank, Grallands, Bishop's Stortford; John Stuart Heeks, and Edward Albert Feuell, both of Harlow, all of England, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Nov. 30, 1966, Ser. No. 597,975
Claims priority, application Great Britain, Jan. 14, 1966, 1,857/66
Int. Cl. H01l 9/00
U.S. Cl. 307—299 **7 Claims**



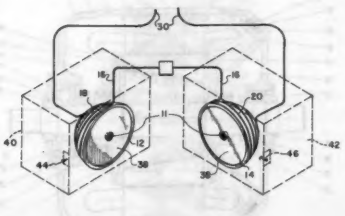
A solid-state device comprising a specimen of multivalley semiconductor material and electric field applying means connected to ohmic contacts attached at one surface of the specimen. The semiconductor material has the innate property of being responsive to electric fields in excess of a critical intensity to cause a redistribution of electric fields so as to nucleate a high electric field region, or domain, and responsive to electric fields in excess of a sustaining intensity, to propagate such high electric field region. A field-sustaining point whereat the electric field intensity is less than a sustaining intensity is defined along an intermediate portion of the specimen. High electric field regions are nucleated and propagated in cyclic fashion such that current through the specimen varies periodically in time in the form of coherent oscillations. The location of the field-sustaining point and, therefore, the frequency of the coherent oscillations in the specimen is continuously controlled by the voltage applied across the ohmic contacts.

3,626,218

SHOCK WAVE CONVERGENCE APPARATUS

Edward L. Shriver, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration

Filed Dec. 31, 1970, Ser. No. 103,229
Int. Cl. H02k 41/00
U.S. Cl. 310—11 **5 Claims**



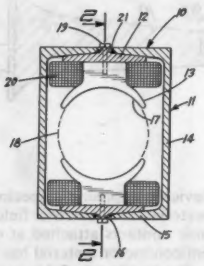
An electrical device developing converging spherical shock waves which are used to treat materials placed inside two

hollow dielectric hemispheres which are fastened together. The device can be used to create phase transformation in crystals, to cause chemical reactions between materials, or to create implosive forces which may be used to compact materials or for other purposes. Wire conductors are wound spirally on the outside of the hemispheres. The device uses a high-voltage, high-current power supply to create a sudden surge of current through the conductors. This sets up radially converging spherical shock waves in electrical conducting material filling the hemispheres. These shock waves converge on the material to be treated in the center of the cavity created by the two hollow hemispheres.

3,626,219
DYNAMO ELECTRIC MACHINE AND METHOD OF MAKING SAME

Leon R. Lease, 708 Bellwood Drive, Mankato, Minn.

Filed May 21, 1970, Ser. No. 39,443
Int. Cl. H02k *15/02*
U.S. Cl. 310—42 **19 Claims**

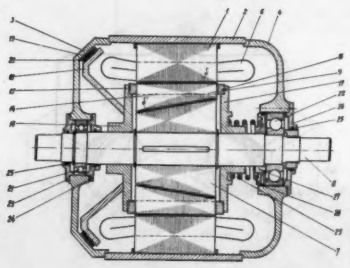


Generators and motors whose housings are formed economically from readily available structural iron. The housings for two-pole units are made from segments of structural channel iron or cold rolled flats. The housings for four-pole units are made from segments of structural angle iron or cold rolled flats. The pole assemblies are precisely positioned by means of an appropriate jig. While the pole assemblies are so positioned, the structural iron members are wedged or otherwise disposed against the pole assemblies and secured, as by welding, to maintain the precise spatial relationships. The units are completed by end plates in which an armature structure is journaled. The housings are formed with a minimum of labor and a minimum of precision metal working operations.

3,626,220
ELECTRIC MOTOR WITH BRAKE

Eugen Niculescu, Bucharest, Romania, assignor to Uzina de Masini Electrice Bucuresti, Bucharest, Romania

Filed Apr. 14, 1970, Ser. No. 28,418
Claims priority, application Romania, Apr. 18, 1969, 59771
Int. Cl. H02k *7/10*
U.S. Cl. 310—77 **6 Claims**



Electric motor consisting of a stator, a cylindrical rotor and a brake. Both the stator and the rotor are provided with windings and are in functional relation one to another. The rotor may turn inside the stator being separated from it by a small airgap.

The rotor consists of two concentric parts, that is, a central conical core, without winding and an outer crown, including the rotor winding, and having an inner hollow of the same conicity as the central core, the central core entering and filling the inner hollow.

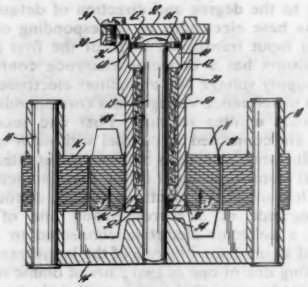
One of the two rotor parts is fixed and the other one is free for a small axial shifting with respect to the first one, the other part being also fixedly attached to the brake movable part.

When the motor is not connected to the supply, it is braked, a small inner airgap δ' being thus formed between the two rotor parts. When the motor is connected to the supply, the two rotor parts are brought into contact, the brake is unlocked, and the motor operates as a normal motor.

3,626,221
ELECTRIC MOTOR WITH PERMANENTLY LUBRICATED BEARINGS

Gordon R. Anderson, and Gordon R. Anderson, Jr., both of Roscoe, Ill., assignors to Airtrol Corporation, Roscoe, Ill.

Filed Sept. 14, 1970, Ser. No. 71,747
Int. Cl. H02k *5/16*
U.S. Cl. 310—90 **2 Claims**



The rotor of a shaded-pole motor includes a central sleeve supported on a stationary shaft by axially spaced inner and outer bearings which are lubricated by an oil impregnated tubular liner telescoped into the sleeve and sandwiched between the two bearings. An oil storage ring disposed in contact with the outboard face of the inner bearing includes angularly spaced fingers which engage the shaft to prevent oil from leaking out of the sleeve and along the shaft. An additional ring is disposed in contact with the outboard face of the outer bearing to return oil to such bearing.

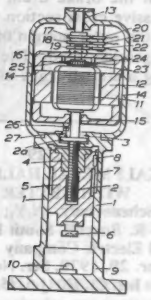
3,626,222
ELECTROMAGNETICALLY CLUTCHED PRESS

Helmut Dischler, Neuss-Uedesheim, Germany, assignor to Becorit Grubenausbau GmbH, Recklinghausen,, Germany

Filed Apr. 10, 1970, Ser. No. 27,212
Claims priority, application Germany, Apr. 12, 1969, P 19 18 637.9
Int. Cl. H02k *7/11*
U.S. Cl. 310—96 **14 Claims**

A spindle press drive assembly using an electric motor's rotor as an energy storing flywheel is characterized in that the electric power drives a second rotor acting as an energy storing flywheel and which is electromagnetically coupled to the first rotor so as to provide rotational energy therefor from the kinetic energy stored in the second rotor. The two rotors are disconnected at the end of the working stroke so that the second rotor remains rotating and only the energy of the first rotor is used during pressing. The two rotors may be coaxial or concentric and the second rotor may be indepen-

gently rotated or rotated by electromagnetic forces between the two rotors. The disconnection can be achieved by a



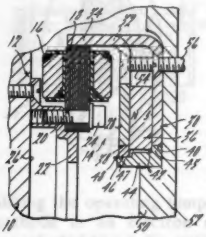
switch which senses the axial force occuring during deformation of a workpiece.

3,626,223

GENERATOR CONSTRUCTION

Richard J. Maier, Pontiac, Mich., assignor to Syncro Corporation, Oxford, Mich.

Filed Mar. 19, 1970, Ser. No. 20,911
Int. Cl. H02k *21/22*
U.S. Cl. 310—153 4 Claims



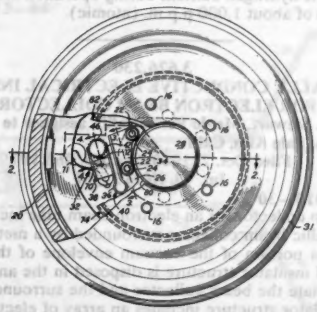
A generator having a pair of armature bodies with interdigitating fingers on each of the armature bodies defining magnetic poles of opposite polarity with one of the armature bodies being nested in the other and with the fingers of each extending in the same axial direction.

3,626,224

WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM HAVING A ROTATING TONE WHEEL AND ELECTROMAGNETIC PICKUP MEANS

John G. Vigneault, and Francis A. Horning, both of South Bend, Ind., assignors to The Bendix Corporation

Filed June 1, 1970, Ser. No. 42,111
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 7 Claims



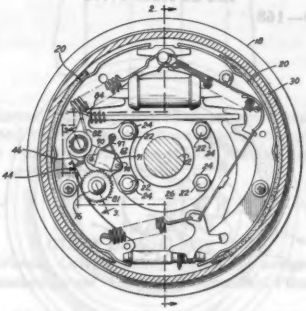
A cup-shaped drive wheel with an elastomeric friction ring secured to the inside surface of the rim of the cup for driving a combination of a driven wheel and a tone wheel element positioned inside the cup. The cup is large enough to be positioned over the axle flange of an automobile and can be secured by being clamped between the brake drum and the outer face of the flange. The tone wheel is a toothed gear which operates in conjunction with a magnetic pickup to give a signal representative of wheel speed.

3,626,225

WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM HAVING A ROTATABLE TONE WHEEL AND ELECTROMAGNETIC PICKUP MEANS

Edward M. Pauwels, South Bend, Ind., assignor to The Bendix Corporation

Filed June 1, 1970, Ser. No. 42,112
Int. Cl. H02k *19/20*
U.S. Cl. 310—168 10 Claims



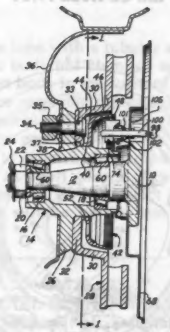
A compact driven wheel, tone wheel and pickup assembly mounted on a unitary housing. The assembly has a leaf spring section which urges the driven wheel into contact with an elastomeric portion of a drive wheel mounted on the vehicle axle or wheel hub. The pickup generates an electric signal which is representative of the rotational speed of the vehicle wheel. The drive wheel can be mounted without removing the axle shaft from the axle housing.

3,626,226

WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM

Edward M. Pauwels, and David D. Jordan, both of South Bend, Ind., assignors to The Bendix Corporation

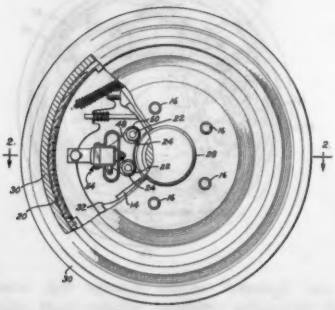
Filed June 1, 1970, Ser. No. 42,168
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 4 Claims



The tone wheel is a heavy walled steel stamping having a flanged central opening adapted for pressing on to a pilot turned on the outside surface of the wheel hub, and a cylin-

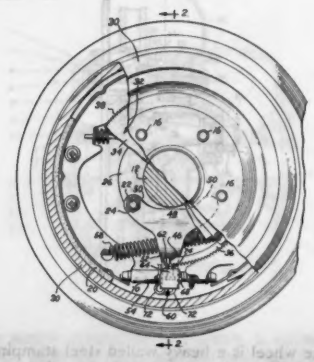
drical flange contiguous to the usual offset portion of the brake disc and having teeth formed on its inside surface. The spaces between the teeth are filled with adhesive nonmagnetic material so that the tooth tips and the nonmagnetic material provide a smooth unbroken cylindrical surface. A radial adjustment for establishing a predetermined clearance between a pickup and the tone wheel is provided by a generally rectangular projection on the back of the pickup which fits into an elongated slot in the pickup bracket. The output of the pickup is used to control the adaptive braking system.

3,626,227
WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM
Irving R. Ritsema, South Bend, Ind., assignor to The Bendix Corporation
Filed June 1, 1970, Ser. No. 42,181
Int. Cl. H02k *17/42*
U.S. Cl. 310—168 **9 Claims**



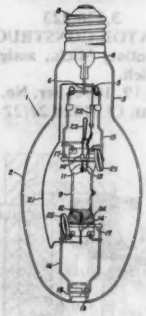
The tone wheel and the electromagnetic pickup are mounted with a running clearance less than the known deflections which occur during severe braking. Both elements are provided with smooth abrasion resistant bearing surfaces and the pickup is spring mounted so that no damage results during the occasional brief rubbing contacts. The projecting elements of the pole piece of the pickup are covered to a predetermined depth by the bearing material so that a minimum clearance is maintained during the periods of contact.

3,626,228
WHEEL SPEED SENSOR FOR AN ADAPTIVE BRAKING SYSTEM
David D. Jordan, and Ward C. Suttle, both of South Bend, Ind., assignors to The Bendix Corporation
Filed June 1, 1970, Ser. No. 42,397
Int. Cl. H02k *19/20*
U.S. Cl. 310—168 **7 Claims**



A wheel speed sensor for use in an adaptive braking system comprising a magnetic pickup and a tone wheel. The tone wheel of a so-called "frictionless"-type wheel speed sensor is formed in two pieces, one of which is a low mass disk or cup adapted to be mounted on the outside of the axle flange and be clamped between the brake drum and said flange. The other is a rather massive cross section ring of ferromagnetic material secured to the outer margin of the disk and formed with evenly spaced gearlike teeth. The toothed portion may be formed by rolling a straight rack element into a circular shape.

3,626,229
JACKETED ALKALI METAL HALIDE VAPOR LAMP WITH GETTER
Henry S. Spacil, Schenectady, N.Y.; Wayne R. Hellman, Euclid, and Peter R. Buccilli, South Euclid, all of Ohio, assignors to General Electric Company
Filed Apr. 29, 1970, Ser. No. 32,927
Int. Cl. H01j *61/52*
U.S. Cl. 313—25 **10 Claims**

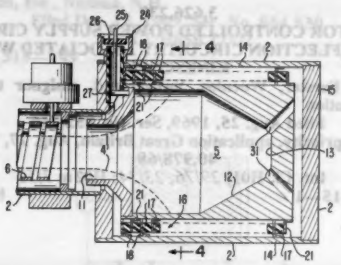


In a jacketed alkali metal halide vapor lamp, loss of alkali metal takes place by the reaction of water vapor in the outer jacket with alkali metal ions which pass out of the inner arc tube through the silica wall to form gaseous metal hydroxide and protons (positively charged hydrogen ions). The protons pass into the arc tube through the silica wall and react with the metal halide to form metal ions and hydrogen which diffuses out. When the ration of H_2/H_2O in the jacket reaches a sufficiently high value, direct reaction of alkali metal ions with hydrogen can continue indefinitely the transfer of alkali metal from the arc tube to the jacket. It is prevented by a getter in the interenvelope space holding the hydrogen pressure down to about 10^{-7} atmospheres or lower, preferably about 10^{-9} atmospheres. A suitable getter is zirconium operating in the temperature range from 350 to 450° C. in sufficient quantity and with low enough initial hydrogen content that its hydrogen content during operation stays below a maximum of about 1,000 p.p.m. (atomic).

3,626,230
THERMALLY CONDUCTIVE ELECTRICAL INSULATOR FOR ELECTRON BEAM COLLECTORS
Robert E. Stewart, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.
Filed Oct. 2, 1969, Ser. No. 863,107
Int. Cl. H01j *25/34*
U.S. Cl. 313—30 **7 Claims**

A beam collector for an electron beam tube includes a hollow metallic beam collector surrounded by a metallic sheath forming a portion of the vacuum envelope of the tube. An electrical insulator structure is disposed in the annular space intermediate the beam collector and the surrounding sheath. The insulator structure includes an array of electrical insulator members with a first array of flexible metallic frame structures joined to said sheath and projecting inwardly to the insulator members. A second array of flexible metallic

frame structures are joined to the collector and project outwardly therefrom to the insulators. The flexible frame structures are joined to the insulator members in electrical insula-



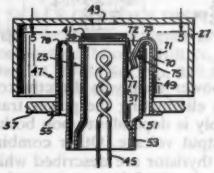
tive relation with respect to each other and provide parallel thermally conductive paths for conduction of thermal energy from the collector to the sheath, while allowing for thermal expansion and contraction of the collector.

3,626,231

THERMAL SHUNT FOR A CATHODE STRUCTURE

Maurice Kahl, Seneca Falls, N.Y., assignor to Sylvania Electric Products Inc.

Filed Mar. 5, 1969, Ser. No. 804,513
Int. Cl. H01j 7/24, 1/02
U.S. Cl. 313—37 **10 Claims**



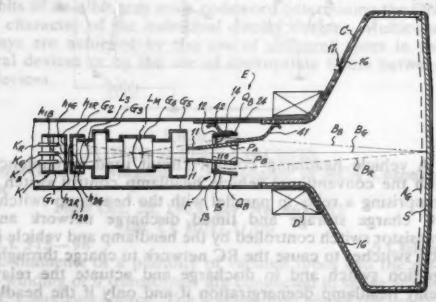
Means for regulating the operating temperature of an indirectly heated cathode in an electron discharge device wherein at least one selected bimetallic member is positioned adjacent the cathode in a manner to allow movement of a portion of the member to make thermal conductive contact with the cathode when influenced by increased temperature resultant from high-voltage cathode heater operation to provide a thermal shunt for reducing cathode-operating temperature to a desired level.

3,626,232

COAXIAL CONNECTOR FOR FINAL ANODE AND CONVERGENCE VOLTAGES

Akio Ohgoshi, Tokyo, and Keito Nakazawa, Yokohama-shi, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 29, 1969, Ser. No. 888,339
Claims priority, application Japan, Dec. 27, 1968, 44/130
Int. Cl. H01j 29/00, 31/20, 31/00
U.S. Cl. 313—64 **7 Claims**



A gun structure for a picture tube of the single-gun, plural beam type is provided with a common voltage supplying terminal attached to the funnel portion of the tube and through which both an anode voltage and a convergence voltage are supplied to the tube.

3,626,233

CHANNEL MULTIPLIER OF ALUMINUM OXIDE PRODUCED ANODICALLY

Eugene Wainer, Shaker Heights; Selwyn H. Rose, Beachwood, and Theodore M. Harkulich, Chagrin Falls, all of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated

Filed Sept. 20, 1968, Ser. No. 764,370
Int. Cl. H01j 43/06, 43/22
U.S. Cl. 313—105 **3 Claims**

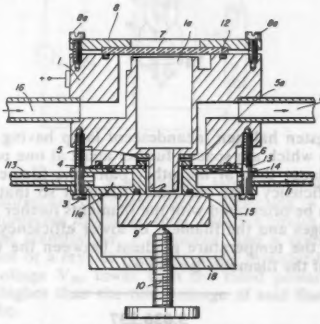
Microchannel plates prepared from anodized aluminum layers etched to increase the pore volume to approximately 50 percent and then treated to exhibit suitable electrical properties for use as a channel plate.

3,626,234

GLOW DISCHARGE TUBE

Werner Grimm, Grossauheim, Germany, assignor to RSV Prazisionsmessgerate GmbH, Hechendorf/Pilsensee, Germany

Filed July 28, 1970, Ser. No. 58,847
Claims priority, application Germany, Mar. 1, 1969, P 19 10 461.1
Int. Cl. G01j 3/12; H01j 17/04, 17/26
U.S. Cl. 313—210 **2 Claims**



A glow discharge tube with a tubular anode extending into an annular cathode body has clamped against the outer face of the cathode a test body in the form of a thick circular disk which in the surface engaging the cathode body is provided with one or more bores arranged in a circular area opposite and smaller than the end of the tubular anode. The bore or bores are adapted to receive the samples of the material to be analyzed, such as short pieces of wires or wire-shaped metal bodies, the ends of which project just a little distance, if any, beyond the surface of the test body engaging the cathode body.

3,626,235

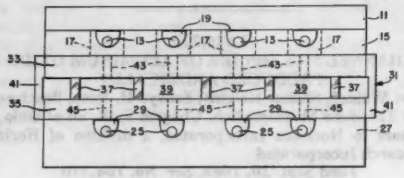
DISPLAY PANEL WITH DOUBLE CATHODE

George A. Kupsky, Milford, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Filed Mar. 13, 1970, Ser. No. 19,299
Int. Cl. H01j 61/66
U.S. Cl. 313—210 **4 Claims**

A display panel including first and second layers of gas-filled cells with cathodes in common between the layers and

with separate anodes associated with each layer. Tiny apertures in the cathodes interconnect respective cells in each



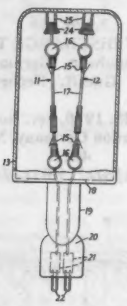
layer. Double-layered cathodes are used to prevent spurious transfer of ionized gas (cathode glow) from the cells in one layer to the respective cells in the other layer.

3,626,236

TUNGSTEN-HALOGEN LAMPS

Kenneth Buckley Robinson, and Henry Alfred Fenn, both of London, England, assignors to Thorn Lighting Limited, London, England

Filed Feb. 25, 1970, Ser. No. 14,011
Claims priority, application Great Britain, Mar. 25, 1969, 15,596/69
Int. Cl. H01k 9/00
U.S. Cl. 313—316 **13 Claims**



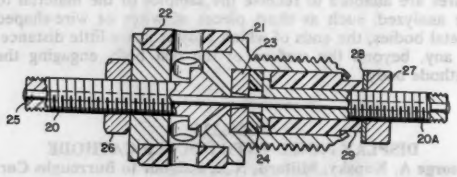
A tungsten halogen incandescent lamp having two planar filaments which are spaced further apart at one pair of edges of the planes than at the other pair, one filament being of lower efficiency than the other filament so that in use the lamp can be orientated with the filaments further apart at the upper edges and the filament of lower efficiency uppermost whereby the temperature gradient between the top and the bottom of the filaments is reduced.

3,626,237

LINE ELECTRICAL SURGE ARRESTOR

Norman A. Bolton, Rochester, and John H. Auer, Jr., Fairport, both of N.Y., assignors to General Signal Corporation, Rochester, N.Y.

Filed Dec. 12, 1968, Ser. No. 783,238
Int. Cl. H01t 1/14, 3/00
U.S. Cl. 313—325 **8 Claims**



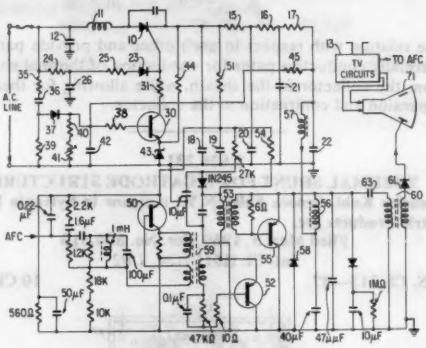
An electrical surge arrestor in which a line electrode is serially connected in the line and a second electrode of predetermined diameter spaced from the line electrode forms a discharge gap.

3,626,238

THYRISTOR CONTROLLED POWER SUPPLY CIRCUITS AND DEFLECTION CIRCUITRY ASSOCIATED WITH A KINESCOPE

Gerhard Forster, Wuenlos, Switzerland, assignor to RCA Corporation

Filed Aug. 25, 1969, Ser. No. 852,766
Claims priority, application Great Britain, Aug. 27, 1968, 40,978/68
Int. Cl. H01j 29/76, 23/34; H02m 7/52
U.S. Cl. 315—1 **8 Claims**



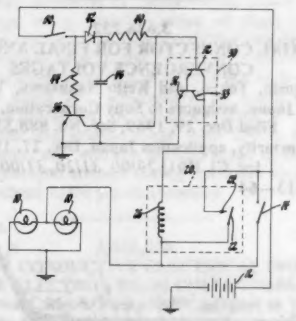
A thyristor power supply is directly coupled to the AC power line thus eliminating the power transformer. Regulation of the supply is dependent upon both the AC potential and the DC output voltage. Other combinations of control voltage for the thyristor are described which, in turn, affect the internal impedance of the power supply of control regulation thereof.

3,626,239

HEADLAMP DEENERGIZATION DELAY SYSTEM

Eugene W. Brock, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed May 25, 1970, Ser. No. 40,092
Int. Cl. B60q 1/06, 1/08
U.S. Cl. 315—83 **3 Claims**



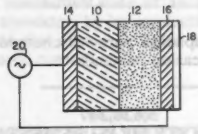
A vehicle headlamp control circuit used in conjunction with the conventional vehicle headlamp control switch and comprising a relay in parallel with the headlamp switch, an RC charge storage and timed discharge network and a transistor switch controlled by the headlamp and vehicle ignition switches to cause the RC network to charge through the ignition switch and to discharge and actuate the relay to delay headlamp deenergization if and only if the headlamp switch is opened after the ignition switch is opened.

3,626,240

PRESSURE-SENSITIVE INDICATING SWITCH

Alfred J. MacIntyre, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Dec. 12, 1969, Ser. No. 884,530
Int. Cl. H05b 37/02
U.S. Cl. 315—149 14 Claims



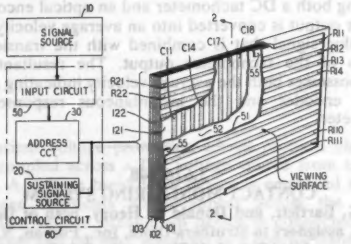
A pressure-sensitive indicating switch comprises an electroluminescent lamp assembly having a pressure-sensitive variable resistance layer interposed between the phosphor and one conductor thereof. Depression of the switch compresses the pressure-sensitive layer, reducing its resistance and allowing current flow through the phosphor thereby illuminating the lamp. Additional provisions include an optical feedback means and means for remotely activating the lamp assembly.

3,626,241

GRAY SCALE GASEOUS DISPLAY

Dinh-Tuan Ngo, Colts Neck, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 24, 1969, Ser. No. 887,994
Int. Cl. H05b 37/00
U.S. Cl. 315—167 15 Claims



An improved gaseous display arrangement is disclosed in which a 2^n level gray scale is provided by stacking n conventional gas discharge display devices separated by respective light attenuating layers, each layer attenuating the display light reaching the viewing surface by a factor of two. The display devices in the stack are addressed in common, respective bits of an n-bit gray scale codeword determining the ON-OFF character of the individual display devices. Multicolor displays are achieved by the use of different gases in the several devices or by the use of appropriate filters between the devices.

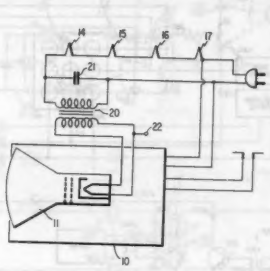
3,626,242

POWER SUPPLY CIRCUITS

Seymour Reich, Livingston, N.J., assignor to RCA Corporation

Filed Oct. 20, 1969, Ser. No. 867,451
Int. Cl. H01j 31/00
U.S. Cl. 315—96 5 Claims

The filaments of a plurality of vacuum tubes and the primary winding of a transformer are connected in series across an AC energizing source. The voltage drop across the primary winding is equal to the difference in the voltage of the AC source and the rated voltage drop across the series connected filaments. The voltage developed across the transformer



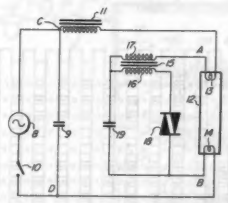
secondary winding is coupled to utilization means such as the filaments of the kinescope for energizing the same.

3,626,243

INSTANTANEOUS STARTER DEVICE FOR A DISCHARGE LAMP EMPLOYING A DIODE THYRISTOR

Shigeo Koyama, Neyagawa-shi; Masao Yasuda, Higashiosaka-shi; Toru Takei, Osaka; Yasutaka Kawai, Higashiosaka-shi, and Takeshi Matsushima, Nara-shi, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma-shi, Osaka, Japan

Filed Aug. 21, 1969, Ser. No. 852,009
Claims priority, application Japan, Aug. 27, 1968, Nov. 4, 1968; 43/74511, 43/97146
Int. Cl. H05b 41/18
U.S. Cl. 315—101 4 Claims



A starter device for a discharge lamp instantaneously lighting a fluorescent discharge tube; connecting in parallel with said fluorescent discharge tube a starter circuit consisting of a pulse transformer, a capacitor, and a symmetrical diode thyristor or a reverse blocking diode thyristor having a breakover voltage V_{BO} lower than the rated power source voltage but higher than the tube voltage of said fluorescent discharge tube.

3,626,244

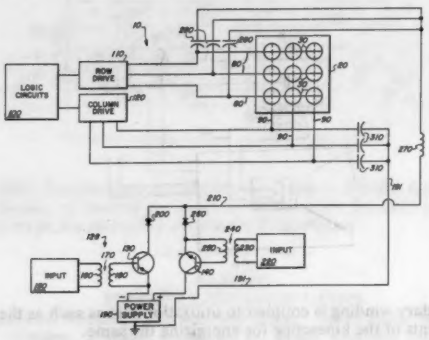
SUSTAINING SIGNALS OF SPACED-APART POSITIVE AND NEGATIVE PULSES FOR MAINTAINING THE GLOW IN MATRIX GAS DISPLAY DEVICES

George E. Holz, North Plainfield, N.J., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of application Ser. No. 668,550, , now abandoned , and a continuation of 824,725, Apr. 25, 1969, now abandoned. This application Dec. 29, 1969, Ser. No. 888,971
Int. Cl. H05b 41/29
U.S. Cl. 315—169 R 21 Claims

The disclosure is of an information display system including a display panel which comprises a plurality of gas-filled cells, each of which is operated by a pair of leads which, when properly energized, causes the gas in the cell between them to glow. After a cell is energized and the energizing signals have been removed from the leads, a sustaining signal is applied which maintains the glow. The sustaining signal is made up of spaced-apart positive and negative waves which are produced by two separate transistor and diode pairs

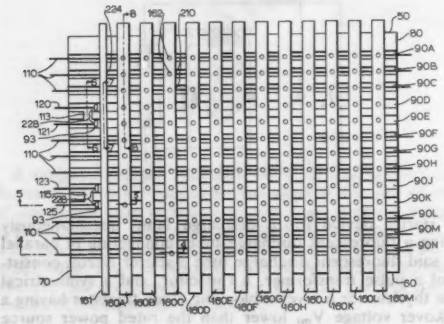
operating a series L-C circuit made up of an inductor and panel cells. The spacing between and the two waves is controlled by the spacing between input pulses which energize the two transistor and diode pairs.



3,626,245
DISPLAY PANEL HAVING A PLURALITY OF DISPLAY REGISTERS

Gerald S. Rosenberg, Edison, and Robert E. Kollmyer, Middlesex, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Filed Apr. 8, 1970, Ser. No. 26,504
Int. Cl. H01j *17/16*
U.S. Cl. 313—220 3 Claims



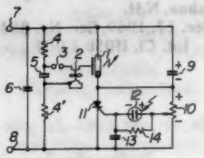
A display panel includes a base plate carrying a plurality of slots in which anode electrodes are positioned. The slots are arrayed in groups with spacing slots exposed between the groups. Cathode electrodes are disposed on the surface of the base plate and operate with the anode electrodes to form scanning gas cells. Auxiliary anode and cathode electrodes are provided in selected spacing slots and are operated as keep-alive cells for the scanning cells.

3,626,246
STROBE DEVICE FOR PHOTOGRAPHY

Masaru Higuchi, Osaka, Japan, assignor to West Electric Co., Ltd., Osaka, Japan

Filed May 9, 1969, Ser. No. 823,440
Claims priority, application Japan, May 15, 1968, 43/33304
Int. Cl. H05b *37/00*
U.S. Cl. 315—241 10 Claims

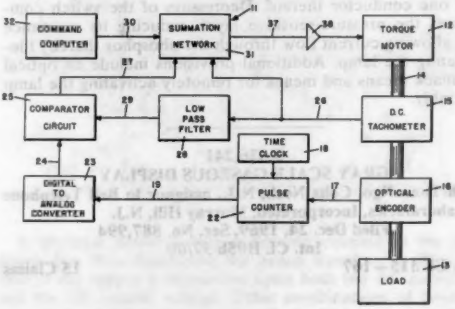
A strobe device for photography, wherein there is provided a main discharge capacitor and light intensifying capacitor, that portion of the light resulting from the light emission of the main discharge capacitor which has been reflected by an object to be picked up is received by a photosensitive element, a silicon controlled rectifier is controlled by the output energy of the photoconductive element, and charges at the light-intensifying capacitor are discharged to a xenon discharge tube as occasion demands.



3,626,247
ANGULAR VELOCITY MEASUREMENT APPARATUS

Edward P. Morse, Norwood, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed July 3, 1969, Ser. No. 839,019
Int. Cl. G01p *3/56*
U.S. Cl. 317—5 11 Claims

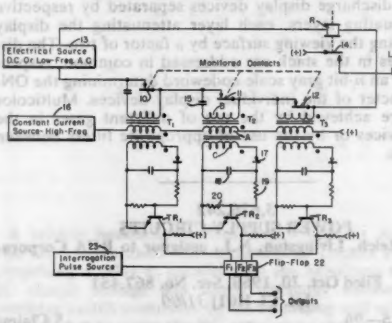


A system for measuring extremely slow angular velocities including both a DC tachometer and an optical encoder. The encoder output is converted into an average velocity indicating analog signal that is combined with the transient components of the tachometer output. The resultant control signal possesses both the average velocity indicating accuracy of the encoder and the instantaneous response of the tachometer.

3,626,248
CONTACT MONITORING SYSTEM

Peter G. Bartlett, and Donald E. Henry, both of Davenport, Iowa, assignors to Struthers-Dunn, Inc., Pitman, N.J.

Filed Feb. 6, 1970, Ser. No. 9,167
Int. Cl. H02h *3/04*
U.S. Cl. 317—9 D 4 Claims



Circuit means for monitoring the conditions of a plurality of contacts, thereby making it possible to determine at each

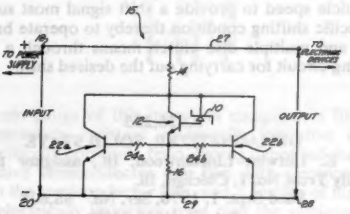
instant which contact is open and which is closed. The output of each contact monitoring circuit is electrically isolated from all of the monitored contacts and also from any circuit in which a monitored contact is included. The monitoring circuit comprises a three-winding transformer for each monitoring contact, with the primary windings of the transformers connected in series and energized from a constant current source of relatively high frequency. A secondary winding of each transformer is connected in shunt with a respective one of the monitored contacts, and a second secondary winding of each transformer has its output voltage rectified and used to control the conductive state of an associated transistor, with the latter transistor, by its conductive state, providing a manifestation of the closed or open condition of the associated monitored contact.

3,626,249

TRANSIENT VOLTAGE PROTECTION CIRCUIT

Marion L. Snedeker, Cleveland, Ohio, assignor to Victoreen Leece Neville, Inc., Cleveland, Ohio

Filed Mar. 12, 1970, Ser. No. 18,961
Int. Cl. H02h *3/22*
U.S. Cl. 317—16 **15 Claims**



A transient voltage protection circuit protects electronic devices coupled across a DC voltage source from transient voltages. A voltage breakdown device is employed to sense the voltage transients which appear across the voltage source. The voltage breakdown device is connected across the collector and the base junctions of a control transistor. A transient voltage above a predetermined magnitude will cause the voltage breakdown device to switch into impedance state thereby turning on the control transistor. The current flowing through the collector-emitter path of the control transistor is supplied as a control current to the bases of two parallel-connected shunting transistors which are driven into saturation when the control transistor is turned on. The shunting transistors are in a low impedance path across the source which includes a current limiting resistor and which loads the transient voltage in order to reduce its peak amplitude. When the shunting transistors are turned on, the voltage across the control transistor and the voltage breakdown device is reduced and the circuit elements are reset.

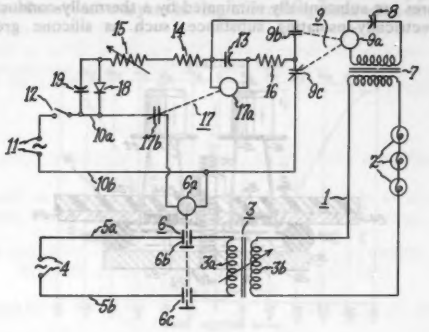
3,626,250

PROTECTIVE CIRCUIT FOR CURRENT REGULATOR

Clair A. Nodurft, East Flat Rock, N.C., assignor to General Electric Company

Filed Oct. 16, 1970, Ser. No. 81,411
Int. Cl. H05b *37/02*; **G01n** *19/16*
U.S. Cl. 317—30 **8 Claims**

Current regulator device comprises constant current transformer having lighting circuit in its secondary and an open circuit protective device with time delay means connected to the transformer primary. The time delay means includes an



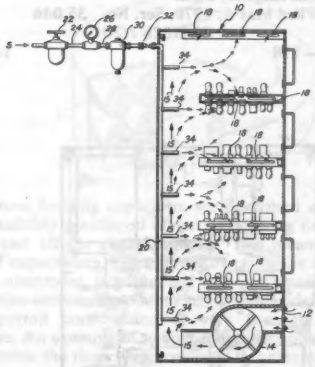
RC circuit for delaying turnoff of the regulator in the event of a break in the lighting circuit.

3,626,251

AIR COOLING SYSTEM FOR CABINET MOUNTED EQUIPMENT

Edward G. Vigue, Mishawaka, Ind., assignor to The Bendix Corporation

Filed Jan. 19, 1970, Ser. No. 3,706
Int. Cl. H05k *7/20*
U.S. Cl. 317—100 **6 Claims**



A cooling system for cabinet-mounted electrical equipment with a large air stream being controlled by a smaller high pressure air stream. A blower located in the bottom of the cabinet forces the main air stream upward. A smaller high pressure air stream is discharged from nozzles to direct the large air stream toward hot spots in the electrical equipment. Outlet ducts located near the electrical equipment provide a path for the large air stream to flow over the hot spots and the component parts and out of the cabinet.

3,626,252

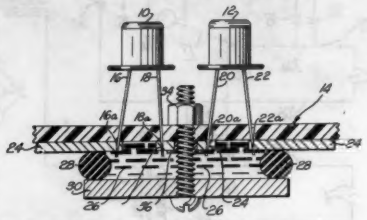
TEMPERATURE EQUALIZATION FOR PRINTED CIRCUITS

Pieter G. Cath, Aurora, Ohio, assignor to Keithley Instruments, Inc., Solon, Ohio

Filed Jan. 21, 1970, Ser. No. 4,475
Int. Cl. H05k *1/02*, *7/20*
U.S. Cl. 317—100 **16 Claims**

Leads of various electronic devices which are mounted on a printed circuit board each form a junction with the conductive pattern on the printed circuit at a different location, and

temperature variations at these junctions may cause undesirable effects in the electrical circuit in which the devices are employed. Thermally-produced effects that result when the junctions of a printed circuit are at different temperatures are substantially eliminated by a thermally-conductive, electrically-insulating substance, such as silicone grease,



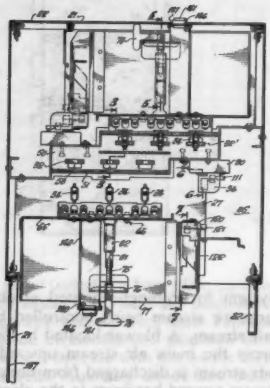
which contacts the leads and the conductive pattern. The thermally-conductive silicone grease is contained in a grease container formed of a rubber "O" ring and an aluminum disk. The rubber "O" ring encircles the grease and is pressed against one side of a printed circuit board, which contains a conductive pattern, by the aluminum disk which is secured to the board.

3,626,253

CELL CONSTRUCTION FOR MOTOR CONTROL CENTER FOR SEPARATE DISENGAGING OF TERMINAL BLOCKS AND BUS STABS

Rex E. Sturdivan, Jackson, Miss., assignor to Zinsco Electrical Products, Los Angeles, Calif.

Filed May 6, 1970, Ser. No. 35,046
Int. Cl. H02b *1/20*
U.S. Cl. 317—118 **14 Claims**



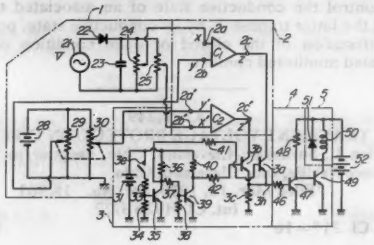
A cabinet for electrical controls of the like, typically a motor control center, having cubicals for slidingly receiving control units with conductors for engaging bus bars and terminal blocks for engaging mating terminal blocks in the cabinet. A sliding plate on the control unit carrying the control unit terminal block for manually engaging and disengaging the terminal blocks without requiring moving of the control unit. A terminal block design permitting a sliding installation of terminal blocks and a sliding installation of contacts within the terminals blocks. A hinged plate installation on the control unit for positioning push buttons and the like at the front of the cabinet. A pressure conductor stab for engaging bus bars behind the control unit cubicals.

3,626,254

AUTOMATIC SHIFT LINE SWITCHOVER SYSTEM FOR AUTOMATIC TRANSMISSION

Mamoru Kawakubo, and Shigehiko Ito, Kariya, both of Japan, assignors to Nippondenso Kabushiki Kaisha, Kariya-shi, Aichi-ken, Japan

Filed Aug. 17, 1970, Ser. No. 64,317
Claims priority, application Japan, Aug. 18, 1969, 44/65225
Int. Cl. H01h *47/32*; B60k *19/00, 21/00*
U.S. Cl. 317—148.5 R **1 Claim**



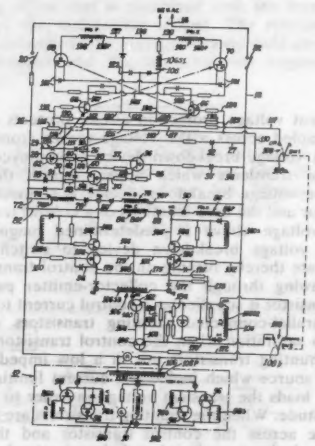
An automatic shift line switchover system for use in an automatic transmission for a vehicle which is responsive to electrical signals representative of the load on the engine and the vehicle speed to provide a shift signal most suitable for the specific shifting condition thereby to operate brake band means and multiple disc clutch means through a hydraulic actuating circuit for carrying out the desired shift.

3,626,255

DEMAGNETIZER, SOLID STATE

Arthur K. Littwin, Lincolnwood, Ill., assignor to Littwin Family Trust No. 1, Chicago, Ill.

Filed Sept. 1, 1970, Ser. No. 68,625
Int. Cl. H01f *13/00*
U.S. Cl. 317—157.5 **11 Claims**



A completely solid state demagnetizer including: a circuit including the object to be demagnetized and including a portion for applying DC to the object, and including portions operable for so applying the DC in successively opposite polarities; a first condenser of fixed capacity chargeable substantially instantaneously, and charged constantly by the power source; a second condenser progressively chargeable, of variable capacity, and having limits above and below that of the first condenser; the first condenser, when the second condenser is charged to a value less than itself, energizing the

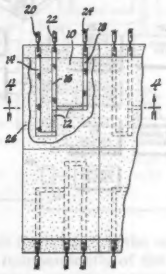
circuit portion operable for applying DC of a first polarity to the object; and the second condenser, when charged to a value greater than that of the first condenser; energizing the circuit portion operable for applying DC of the opposite polarity to the objects; an additional condenser means providing a decaying action for progressively and continuously reducing the value of the voltage applied to the object.

3,626,256

THIN FILM SEMICONDUCTOR STRAIN GAUGES AND METHOD FOR MAKING SAME

Verne R. Brown, Ann Arbor, Mich., assignor to Transidyne General Corporation, Ann Arbor, Mich.

Filed Oct. 16, 1970, Ser. No. 81,409
Int. Cl. H01l 5/00
U.S. Cl. 317—234 17 Claims



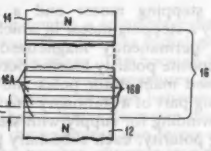
The strain gauge of this invention comprises a film of a high temperature resistant electrically insulative organic resin, specifically polyimide resin, having deposited thereon a piezoresistive semiconductor thin film with electrical leads bonded to the semiconductor film, and a coating of high heat resistant electrically insulative resin over the semiconductor film. Further in accordance with the preferred embodiment of the invention, such a strain gauge is manufactured by depositing the film of heat resistant organic onto a plate of ceramic, preferably aluminum oxide ceramic, sequentially depositing first the semiconductor film and then the electrical leads onto the organic resin and thereafter applying the coating of heat resistant organic resin over the deposited film of semiconductor. As the last step in manufacture suitable electrically insulated metal wires are soldered or otherwise bonded to exposed portions of the deposited electrical leads. Prior to use the strain gauge, i.e. the film of organic resin having the resin coated semiconductor film and electrical leads with associated wires thereon, can be easily peeled from the ceramic plate and suitably bonded to the structural member which is to be measured for strain.

3,626,257

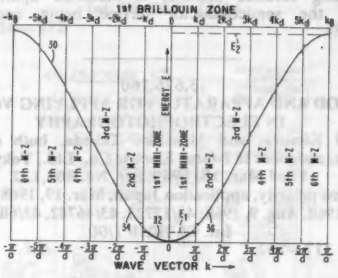
SEMICONDUCTOR DEVICE WITH SUPERLATTICE REGION

Leo Esaki, Chappaqua; Rudolf Ludeke, Katonah, and Raphael Tsu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,871
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 22 Claims



The semiconductor device has two highly N-type end portions to which ohmic contacts are made, and a central portion which has a one dimensional spatial periodic variation, in its band-edge energy. This spatial periodic variation, or superlattice, is produced by doping or alloying to form a plurality of successive layers having alternating band-edge energies. The period of the spatial variation is less than the carrier mean free path, and is such as to form in momentum space a plurality of periodic mini-zones which are much smaller than the Brillouin zones. The device exhibits a bulk negative resistance and is used in oscillator and bistable circuits.

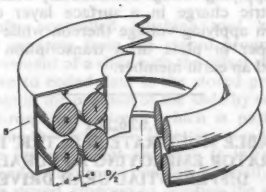


3,626,258

STANDARD CAPACITOR

David M. Makow, 14 Davidson Crescent, Ottawa 9, Ontario, Canada

Filed Oct. 28, 1970, Ser. No. 84,737
Int. Cl. H01g 1/02
U.S. Cl. 317—242 9 Claims



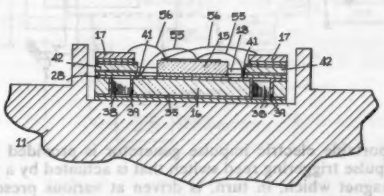
Structures forming capacitors are described which consist of four suitably positioned electrodes closing on themselves so that end effects are eliminated. The mean of the two values of capacitance, represented by two pairs of diagonally opposite electrodes, is influenced to a very small degree only by the cross-sectional geometry of the electrodes. These properties permit construction of very accurate and stable capacitors. An example of one embodiment utilizes four rings as electrodes; the rings being enclosed by an external shield.

3,626,259

HIGH-FREQUENCY SEMICONDUCTOR PACKAGE

Vahan Garboushian, Torrance, and Herbert Ruzinsky, Manhatten Beach, both of Calif., assignors to TRW Inc., Los Angeles, Calif.

Filed July 15, 1970, Ser. No. 54,904
Int. Cl. H01l 5/00
U.S. Cl. 317—234 R 21 Claims



A package for a high-frequency semiconductor device. A semiconductor wafer having interdigitated active regions

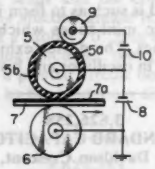
formed therein is mounted upon a portion of a metallized thermally conducting ceramic member. A conducting member is mounted upon and insulated from a second portion of the metallized ceramic member via a second ceramic member. The active regions of the device are contacted by interlaced, stitch bonded contacts. The metallized thermal conducting ceramic member is mounted upon a metal header, the semiconductor device being encapsulated thereon.

3,626,260

METHOD AND APPARATUS FOR APPLYING VOLTAGE IN ELECTROPHOTOGRAPHY

Takuhei Kimura, and Masahiro Takeda, both of Tokyo, Japan, assignors to Iwatsu Electric Co., Ltd., Tokyo, Japan

Filed Mar. 18, 1969, Ser. No. 808,132
Claims priority, application Japan, Mar. 19, 1968, July 4, 1968, Aug. 9, 1968; 43/17722, 43/46742, 43/68379
Int. Cl. H01b 1/00
U.S. Cl. 317—262 **20 Claims**



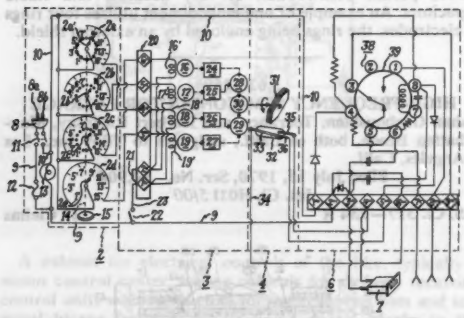
In an electrophotographic operation, a method and apparatus for applying voltage continuously without accumulating an electric charge in a surface layer of a dielectric resulted from applying voltage thereon while sandwiching a sensitive paper or plate or a transcription paper by the dielectric and an earth member.

3,626,261

PORTABLE MULTIRATE ELECTRIC IMPULSE GENERATOR EMPLOYING A PLURAL MOTOR DIFFERENTIAL GEAR DRIVE

Donald M. Ham, Rochester, N.H., assignor to General Electric Company

Filed Oct. 23, 1970, Ser. No. 83,395
Int. Cl. H02p 7/68
U.S. Cl. 318—8 **11 Claims**



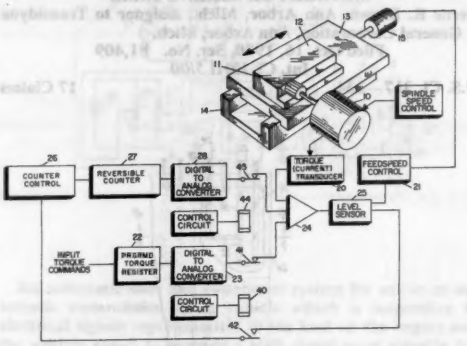
A portable electric impulse generator is provided having an impulse triggering reed switch that is actuated by a rotatable magnet which, in turn, is driven at various preselected rates of speed by a differential gear train. The differential gear train is driven at a rate determined by the selective energization of a plurality of synchronous motors that are operatively coupled to input gears of the gear train.

3,626,262

NO-LOAD TORQUE COMPENSATION SYSTEM AND THE APPLICATION THEREOF IN ADAPTIVE CONTROL

Leroy U. C. Kelling, Waynesboro, Va., assignor to General Electric Company

Filed Aug. 22, 1969, Ser. No. 852,412
Int. Cl. B23q 5/10; G06g 7/00, 7/12
U.S. Cl. 318—39 **5 Claims**



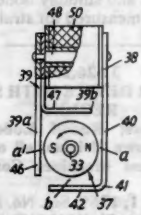
The torque losses in the spindle drive of a cutting tool rotating under no-load conditions are measured and stored in digital form. The stored value is used to modify programmed torque values during a later cutting operation so as to achieve the programmed torque at the cutting tool rather than merely at the spindle drive.

3,626,263

ELECTRIC STEPPING MOTOR AND REMOTE REGISTER OPERATED THEREBY

Maurice Graham McBride, Barnet, England, assignor to Sangamo Weston Limited, Enfield, England

Filed Mar. 6, 1970, Ser. No. 17,084
Claims priority, application Great Britian, Oct. 7, 1969, 49,260/69
Int. Cl. H02k 37/00
U.S. Cl. 318—138 **6 Claims**



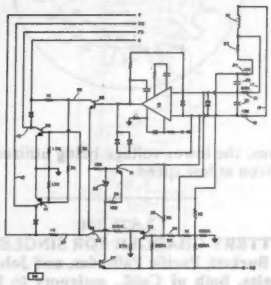
Electric stepping motor and a remote meter register operated by a stepping motor in which the motor comprises a cylindrical permanently magnetized rotor with diametral poles of opposite polarity located between a pair of diametrically opposed main stator poles and at least one subsidiary pole forming part of a stationary flux system embraced by an operating winding for supply with stepping current pulses of alternating polarity, each subsidiary pole being more widely separated from the adjacent surfaces of the rotor than the main poles to ensure constant direction of rotation through an arc of 180° for each operating current pulse.

3,626,264

VELOCITY SERVOSYSTEM

Martin O. Halfhill, and Frank J. Sordello, both of San Jose, Calif., assignors to Information Storage Systems, Inc., Cupertino, Calif.

Filed Aug. 20, 1969, Ser. No. 851,695
Int. Cl. H02p 5/16
U.S. Cl. 318—331 5 Claims



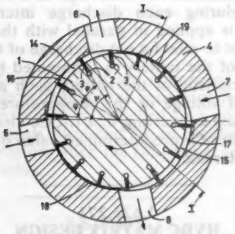
A velocity servocircuit for retracting the access mechanism of a disk storage drive independently of the normal position servo, including a summing amplifier connected to deliver a motor drive signal to the access motor, means providing a velocity command input to the amplifier from a signal source and means providing a velocity feedback to the amplifier derived from the back EMF of the motor.

3,626,265

VANE PUMP OR MOTOR

Hillebrand Johannes Josephus Kraakman, Emmasingel, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 16, 1969, Ser. No. 858,411
Claims priority, application Netherlands, Sept. 18, 1968, 6813309
Int. Cl. F01c 1/00; F03c 3/00; F04c 1/00
U.S. Cl. 418—266 1 Claim



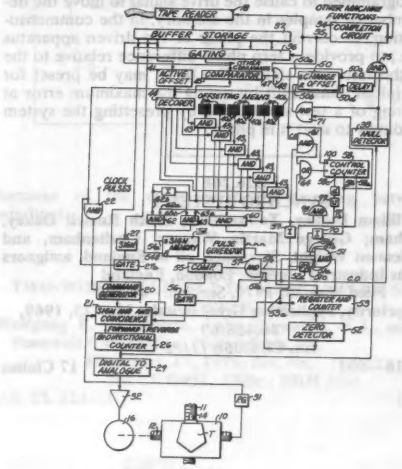
A vane pump or motor having a rotatable cylindrical disc incorporated in a housing. The disc has radial grooves provided with radially movable vanes. The housing has at least one pair of associated inlet and outlet apertures, and the part of the inner wall of the housing situated between said apertures is cylindrical and has a larger diameter than the disc. The inner wall between the apertures also forms a boundary for a working space. The number of vanes in a disc is relatively large so that at least two vanes are present between an inlet aperture and an associated outlet aperture.

3,626,266

NUMERICALLY CONTROLLED MACHINE TOOL INCLUDING ZERO OFFSET CONTROL

Emmett F. Sindelar, Parma, and John Klein, Fairview Park, both of Ohio, assignors to The Warner & Swasey Company, Cleveland, Ohio

Filed July 25, 1969, Ser. No. 844,803
Int. Cl. G05b 19/24
U.S. Cl. 318—572 20 Claims



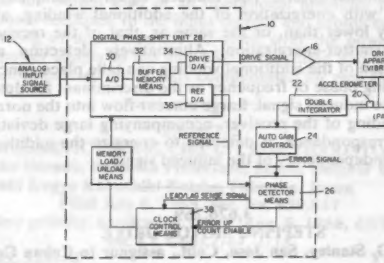
A numerically controlled machine tool having offset storage means separate from the stored program for controlling the movement of a slide with the offset storage means being responsive to coded data in the stored program to introduce an offset in the position of the slide by supplying pulses to a pulse-responsive circuit which is part of a servo means for moving the slide. The offsetting means is operable to first remove existing offset and then to introduce a new offset and to render electronic controls normally operable in response to the stored program to position the slide ineffective until the change in offset is effected when the latter is called for by the stored program.

3,626,267

DIGITAL PHASE-CORRECTING SERVO FOR CONTROLLING THE PHASE OF AN ANALOG DRIVE SIGNAL

John T. Bobbitt, Houston, Tex., assignor to Mandrel Industries, Inc., Houston, Tex.

Filed Nov. 6, 1970, Ser. No. 87,390
Int. Cl. G05b 19/28
U.S. Cl. 318—686 9 Claims



An analog drive signal for driving a vibrator, motor, or like driven apparatus, is converted to a digital signal and is delayed in a digital buffer memory. The memory is unloaded

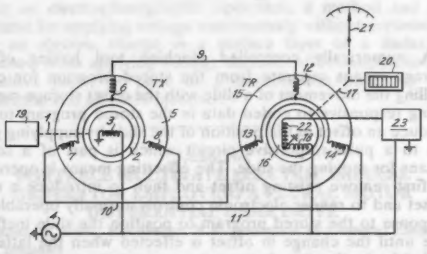
at two separate discrete times and the resulting digital signals are converted to provide an analog reference signal and an analog drive signal. The reference signal is unloaded at a constant rate relative to the input load rate but is displaced in time by a selected number of total memory locations. The drive signal is unloaded at a programmable rate. The phase relation, i.e., error signal, and signals indicative of the lead or lag of the error signal relative to the reference signal, are sensed and any phase difference detected is counted in units of sample rate time and stored. Associated digital control logic is programmed to cause the drive signal to move the detected number of samples in the memory, in the commensurate direction, to correct the phase of the driven apparatus output, i.e., to provide a zero phase difference relative to the phase of the reference signal. The servo may be preset for minimum initial phase shift by noting the maximum error at the beginning of a test sweep, and by presetting the system correspondingly to start it in phase.

3,626,268

SYNCHRO SYSTEMS

Dennis William Dudley, Tewkesbury; Keith Russell Oakey, Cheltenham; George Martin Warner, Cheltenham, and John Clement Wright, Stevenage, all of England, assignors to Smiths Industries Limited, London, England

Filed May 25, 1970, Ser. No. 40,282
Claims priority, application Great Britain, May 23, 1969, 26,468/69
Int. Cl. G05b *11/12*
U.S. Cl. 318—691 **17 Claims**



A synchro torque receiver has its rotor wound with an additional winding at right-angles to its existing, continuously energized rotor-winding. The three-phase stator-windings of the receiver are energized conventionally from the corresponding windings of a synchro torque transmitter. A control unit detects signals induced in the additional rotor-winding of the receiver and energizes this to create torque aiding the normal reactive torque that drives the receiver-rotor to maintain rotational correspondence between the receiver- and transmitter-rotors. The induced signal is sampled alternately with energization of the additional winding, at a frequency lower than, or the same as, that of the receiver- and transmitter-energization. Alternatively detection and energization of the additional winding can take place concurrently using phase or frequency as the discriminant for detection of the induced signal. Large current-flow into the normal rotor-winding of the receiver, accompanying large deviation from correspondence, is detected to energize the additional winding independently of the induced signal.

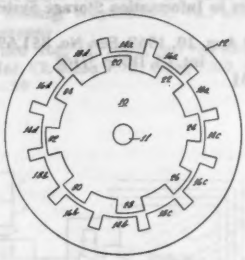
3,626,269

STEPPING MOTOR DRIVE

Donald O. Stanley, San Jose, Calif., assignor to Calma Company

Filed Aug. 25, 1969, Ser. No. 852,591
Int. Cl. H02k *37/00*
U.S. Cl. 318—696 **8 Claims**

Apparatus and method for efficiently driving an incremental motor at high or low speeds utilizing two different driving voltages, the higher of which drives the motor from one increment to the next, and the lower of which establishes detent positions; the lower voltage being utilized only when the motor is driven at low speed.

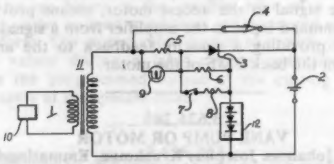


3,626,270

BATTERY CHARGER FOR SINGLE CELLS

Wilford B. Burkett, Pacific Palisades, and John H. Bigbee, III, Los Angeles, both of Calif., assignors to McCulloch Corporation, Los Angeles, Calif.

Filed Mar. 20, 1970, Ser. No. 21,438
Int. Cl. H02j *7/10*
U.S. Cl. 320—35 **13 Claims**



A method and circuit for rapid charging batteries, and in particular single cells wherein a battery is charged by imparting a progressively increasing charge to the battery by subjecting the battery to alternating charging and discharging intervals after a first interval in which a net discharge takes place through a path including a thermal switch which opens the current path in response to current flow therethrough. During a charging interval charge current pulses are applied to the battery being charged through a current path including a unilateral impedance element, such as a silicon-controlled rectifier, and during each discharge interval, a charge-discharge path is applied in parallel with the unilateral impedance element to effect a net discharge of the battery. The rapid charging of the battery is terminated by monitoring a terminal characteristic of the battery such as the quiescent battery terminal voltage or the temperature of the battery being charged and converting to a trickle charge in response to the attainment of a predetermined value of the monitored terminal characteristic.

3,626,271

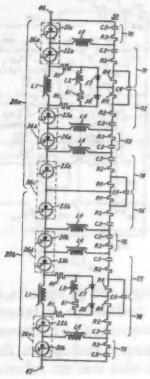
HVDC MATRIX DESIGN

Clyde G. Dewey, Drexel Hill, Pa., assignor to General Electric Company

Filed Dec. 29, 1969, Ser. No. 888,432
Int. Cl. H02m *7/00*; H03r *17/06*
U.S. Cl. 321—11 **20 Claims**

An improved commutation transient suppressing circuit for a thyristor composed matrix. The circuit includes an auxiliary saturable core inductor for absorbing a portion of available stray capacitance energy. Further saturable core inductors are provided to limit discharge current from associated resistance-capacitance voltage-dividing subcircuits. A capacitor is utilized shunting a portion of the resistance of certain adjoining voltage dividing bypass subcircuits to control the order of turn on of the matrix thyristors in response to a volt-

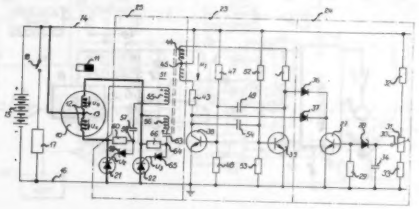
age surge. A switching matrix having an odd number of serially connected thyristor sections per main saturable core inductor is also disclosed and can be placed in series with other similar matrices to use mechanically paired thyristor sections.



3,626,272
VOLTAGE REGULATOR ARRANGEMENT

Peter Pfeffer, Lauffen, Germany, assignor to Robert Bosch GmbH, Stuttgart, Germany

Filed May 18, 1970, Ser. No. 38,270
Claims priority, application Germany, May 23, 1969, P 19 26 332.2
Int. Cl. H02p 9/30
U.S. Cl. 322—28 **12 Claims**



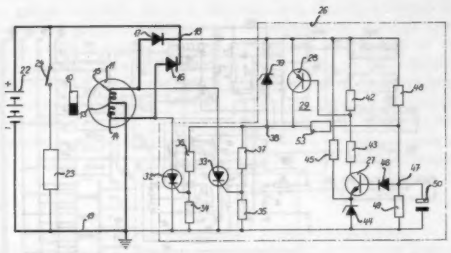
A first and second thyristor are connected to the output winding of an alternating-current generator for rectification purposes. The thyristors are switched to a conducting position by control signals furnished by an oscillator alternately to each of the thyristors when the DC output voltage is below a predetermined value.

3,626,273
VOLTAGE REGULATOR ARRANGEMENT FOR PREVENTING OVERVOLTAGES

Peter Pfeffer, Lauffen, and Edgar Kuhn, Gerlingen, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed May 18, 1970, Ser. No. 38,378
Claims priority, application Germany, May 23, 1969, P 19 26 317.3
Int. Cl. H02p 9/00
U.S. Cl. 322—28 **9 Claims**

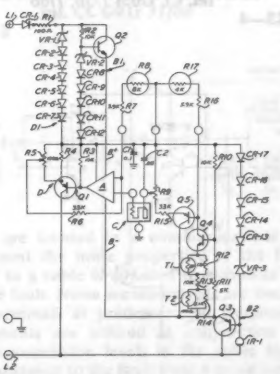
Two closely coupled output windings of an AC generator have a common point. A first and second thyristor are connected across the windings, the voltages across each having opposite polarity. When the load voltage drops below a predetermined value, control pulses are applied to the gates of both thyristors. Therefore, they fire in turn, causing a substantially uninterrupted short circuit across both windings because of the close magnetic coupling between the windings.



3,626,274
TWO-WIRE MILLIVOLT TO MILLIAMPERE SIGNAL CONVERTER

Wolfgang F. Christofzik, Lake Hiawatha, N.J., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Sept. 17, 1970, Ser. No. 72,932
Int. Cl. G05f ; G08c ; H03f 3/04
U.S. Cl. 323—1 **12 Claims**



A circuit system for converting small DC signals into milliampere signals in which the signals from a voltametric sensing device are converted into standard level current signals for transmission over the same two-wire power lines that supply voltage to the circuit. A current sensor imposed across the output load of an operational amplifier provides fractional feedback to the input thereof and produces a voltage swing of approximately 30 volts, over the power lines. The power supply to the amplifier is regulated and temperature compensated and is fully compensated for zero shift.

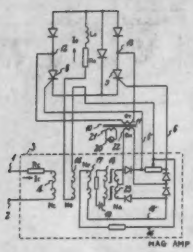
3,626,275
MAGNETIC FIRING CIRCUIT FOR THYRISTORS

Kosuke Harada, Fukuoka Prefecture, Japan, assignor to Seibu Denki Kogyo Kabushiki Kaisha, Fukuoka, Japan

Filed July 8, 1969, Ser. No. 839,841
Claims priority, application Japan, Aug. 6, 1968, 43/56296
Int. Cl. G05f 1/44, 1/38
U.S. Cl. 323—4 **3 Claims**

A novel control circuit for constant current applications. The circuit comprises a thyristor bridge which is fired by a magnetic amplifier. The DC output current of the thyristors flows through the feedback winding of the magnetic amplifier to cancel the effect of the input ampere-turns, and to keep the output current constant through the equal ampere-turns

characteristic of the conventional saturable reactor. Because thyristors are used in the output stage, the new circuit can control a large amount of output power with a device of light

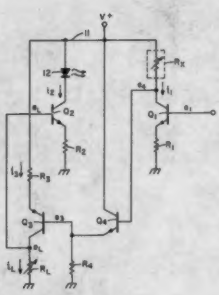


weight and small size. The principle of the new circuit is also effectively applied to parallel operation of multithyristors, in which individual currents can be adjusted to various desired values.

3,626,276
LIGHT-COUPLED, VOLTAGE-CONTROLLED CONSTANT-POWER SOURCE

Robert Louis McGill, Jr., Fallston, and Norman Green, Timonium, both of Md., assignors to The Bendix Corporation

Filed Sept. 29, 1969, Ser. No. 861,782
Int. Cl. G05f 1/56, 1/66
U.S. Cl. 323—4 **14 Claims**



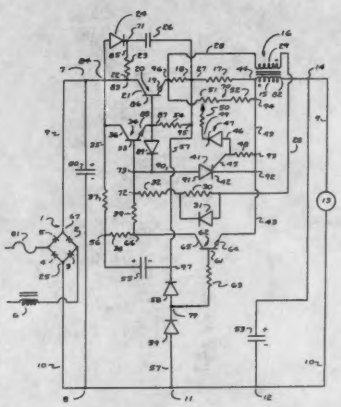
A solid-state circuit for supplying constant power to a varying resistive load in response to a control voltage includes a light source and a photosensitive resistor. Load current is generated by a load current generator operating in response to a control signal. Resultant voltage drop across the load controls a second current generator which is serially connected with a light source. A third current generator, controlled by an independent control voltage, is serially connected with a photosensitive resistor exposed to the light source. Voltage on the photosensitive resistor comprises the control signal which controls the load current generator.

3,626,277
CURRENT REGULATOR SUITABLE FOR MERCURY LAMP BALLAST

Robert D. Munson, St. Louis County, Mo., assignor to Emerson Electric Co.

Filed July 27, 1970, Ser. No. 58,235
Int. Cl. H02m 7/24; H05b 41/14; G05f 1/64
U.S. Cl. 323—17 **13 Claims**

An electrical circuit has a quick-acting switch electrically connected in series between a variable load and a rectified power input. A switch control circuit is provided which connects the switch in its power on position when circuit current is a minimum and disconnects it as current reaches a predetermined maximum. A transformer primary winding is utilized to maintain current in the load during switch off times while its secondary winding is used to commutate a silicon-controlled rectifier in the switch control circuit. The

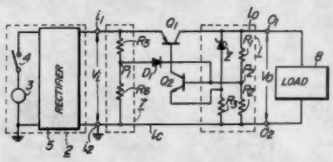


switch is held in the off position until current in the transformer primary approaches zero, at which time the switch is recycled.

3,626,278
COLLECTOR FOLLOWER-TYPE TRANSISTORIZED VOLTAGE REGULATOR

Koji Matsumura, Kodaira, and Kunio Seki, Higashimurayama, both of Japan, assignors to Hatachi, Ltd., Tokyo, Japan

Filed Mar. 6, 1970, Ser. No. 17,077
Claims priority, application Japan, Mar. 12, 1969, 44/18324
Int. Cl. G05f 1/56, 1/64
U.S. Cl. 323—22 T **10 Claims**



A starting circuit is required in the voltage regulator of the so-called collector follower type, in which a voltage source is connected to an emitter input circuit of a regulating transistor and a load to its collector output circuit. In the voltage regulator of this invention, the starting circuit consists of a diode connected between the emitter input circuit and the collector output circuit of the regulating transistor. The diode supplies a starting current to the regulating transistor at a starting moment when an operating voltage is applied to the emitter input circuit of the regulating transistor, and it is reversely biased in the normal operating state of the regulating transistor, being electrically cut off. This invention attains effective voltage regulation even for a load current at a low level.

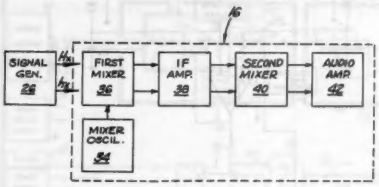
3,626,279
METAL DETECTOR UTILIZING RADIO RECEIVER AND HARMONIC SIGNAL GENERATOR

Charles D. Walden, 31145 E. Hiway 99, Redlands, Calif.

Filed May 15, 1970, Ser. No. 37,636
Int. Cl. G01v 3/12
U.S. Cl. 324—3 **6 Claims**

A metal detector using an ordinary radio receiver and a signal generator having its fundamental and second harmonic

frequencies located equidistantly on either side of the frequency of the local oscillator of the radio. The fundamental and second harmonic of the generator are beat against the frequency of the local oscillator, producing two difference signals that are amplified and rebeat together to produce and



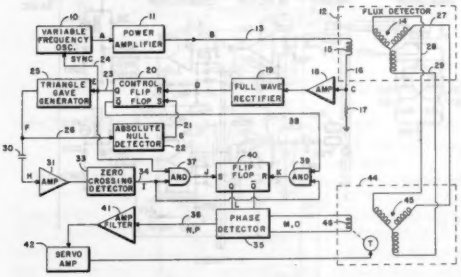
audio signal. Frequency change in the signal of the generator due to inductance of metal is multiplied threefold in audio output, which triples sensitivity as compared with other detectors. The search coil comprises a printed circuit board having concentric coil circles on one side and radial shielding lines on the other.

3,626,280

FREQUENCY CONTROLLED FLUX DETECTOR EXCITATION

Clarence A. Van Englehoven, Marion, and David L. Richter, Cedar Rapids, both of Iowa, assignors to Collins Radio Company, Cedar Rapids, Iowa

Filed Apr. 3, 1970, Ser. No. 25,478
Int. Cl. G01r *33/02*
U.S. Cl. 324—43 R **8 Claims**



A flux detector saturation control circuit senses core saturation time for monitoring rate of change of current through the core drive winding. A frequency control loop for the core driving source is responsive to saturation detection to maintain a time symmetry between a driving source synchronizing waveform and core saturation time occurrences such that saturation is caused to occur midway in successive half-cycles of the driving source waveform.

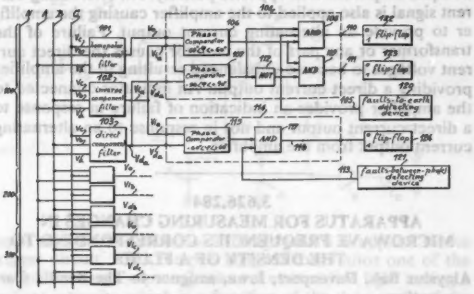
3,626,281

METHOD FOR THE SELECTIVE DETECTION OF THE DEFECTIVE CONDUCTOR OR CONDUCTORS IN A THREE-PHASE SYSTEM

Michel Henry Pierre Souillard, Fontenay-aux-Roses, France, assignor to Compagnie Des Compteurs, Paris, France

Filed July 3, 1969, Ser. No. 839,011
Claims priority, application France, July 5, 1968, 158001
Int. Cl. G01r *31/02*
U.S. Cl. 324—51 **5 Claims**

A method for selecting a conductor or conductors of a three-phase power transport line and device for operating the same which when an earth fault has been determined detects for which phase the negative sequence or inverse component makes with the zero sequence or homopolar component an angle less than 60° then for which of the detected phase the negative sequence or inverse and the positive sequence or



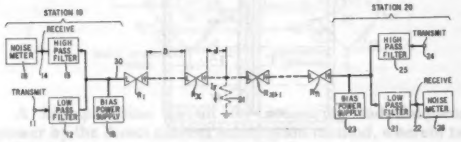
direct components make an angle exceeding 90°, and which when a defect not earthed has been determined detects for which of the phases the angle between the inverse and direct components make an angle less than 60°.

3,626,282

METHOD FOR LOCATING SHUNT FAULTS IN A CABLE UTILIZING THE FAULT AS A NOISE SOURCE

Sherman Theodore Brewer, Little Silver, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Mar. 2, 1970, Ser. No. 15,520
Int. Cl. G01r *31/08*
U.S. Cl. 324—52 **6 Claims**



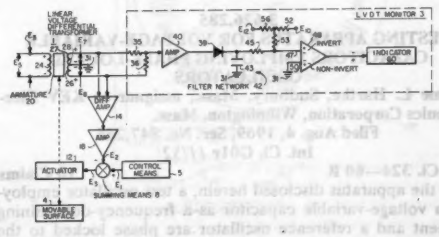
Shunt faults are located in a communications cable by turning to account the noise properties of the fault. Bias power supplied to a cable is adjusted to maximize the noise generated at the fault. Noise measurements are made at each of the cable terminals at predetermined frequencies. The noise measurements are utilized in conjunction with the preestablished transmission levels in the cable to obtain a measure of the distance to the fault from a cable terminal.

3,626,283

APPARATUS FOR MONITORING AND INDICATING AN OPERATIONAL FAILURE OF A LINEAR VOLTAGE DIFFERENTIAL TRANSFORMER

Robert L. James, Bloomfield, and Frank Antonazzi, New Milford, both of N.J., assignors to The Bendix Corporation

Filed Dec. 11, 1969, Ser. No. 884,111
Int. Cl. G01r *31/02, 31/06*
U.S. Cl. 324—55 **2 Claims**



A device for monitoring and indicating an operational failure of a linear voltage differential transformer and includ-

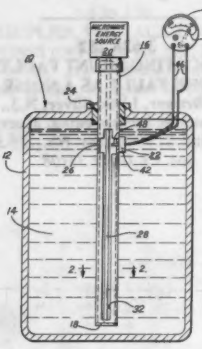
ing summing means which sums the secondary voltages from the transformer. The sum signal is converted to a direct current voltage which is applied to an operational amplifier where it is balanced with a reference direct current voltage of equal amplitude and opposite polarity. An alternating current signal is also applied to the amplifier causing the amplifier to provide an alternating current output. Failure of the transformer or any part of the monitor causes the direct current voltages to become unbalanced resulting in the amplifier providing a direct current output. An indicator connected to the amplifier provides an indication of failure in response to a direct current output and not in response to an alternating current output from the amplifier.

3,626,284

APPARATUS FOR MEASURING CHANGES IN MICROWAVE FREQUENCIES CORRESPONDING TO THE DENSITY OF A FLUID

Aloysius Bak, Davenport, Iowa, assignor to The Bendix Corporation

Filed Aug. 7, 1969, Ser. No. 848,240
Int. Cl. G01r *27/04*
U.S. Cl. 324—58.5 B **3 Claims**



An apparatus for measuring the density of a dielectric fluid retained in a vessel. A waveguide is inserted into the liquid through a sealed opening in the vessel. The waveguide has a center conductor concentrically positioned in the waveguide. The center conductor carries a microwave frequency emitted from a source to a disc on the bottom of the waveguide where a fixed node of the microwave frequency occurs. A detector member immersed in the fluid is fixed to the waveguide a predetermined distance from the bottom of the waveguide to receive a node of the standing wave created by the microwave frequency. With a change in the fluid density, the node adjacent the detector member will correspondingly shift with the detector member receiving a different electromagnetic field intensity created by a microwave energy source transmitted through the waveguide. The detector member will communicate all measurements of the electromagnetic field intensity to an indicator where density changes can be directly read from a scale.

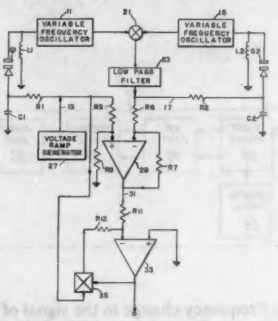
3,626,285

TESTING APPARATUS FOR VOLTAGE-VARIABLE CAPACITORS EMPLOYING PHASE-LOCKED OSCILLATORS

Jerome L. Hartke, Sudbury, Mass., assignor to KEV Electronics Corporation, Wilmington, Mass.

Filed Aug. 4, 1969, Ser. No. 847,266
Int. Cl. G01r *11/52*
U.S. Cl. 324—60 R **10 Claims**

In the apparatus disclosed herein, a test oscillator employing a voltage-variable capacitor as a frequency-determining element and a reference oscillator are phase locked to the same frequency. The phase lock circuit employs a phase detector and a low-pass filter to provide a DC error signal having an amplitude which is a function of the phase difference between the output signals of the two oscillators. This DC voltage is applied to the voltage-variable capacitor thereby controlling the frequency of the test oscillator to obtain



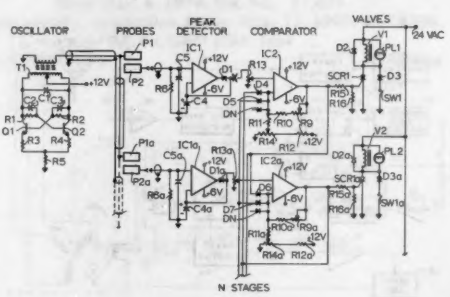
phase lock. As the operating frequency of the reference oscillator is varied as a function of time, the amplitude of the DC error signal is used as a measure of the voltage-dependent capacitance characteristic of the capacitor under test.

3,626,286

CAPACITIVE MOISTURE CONTROL SYSTEM HAVING A PEAK DETECTOR

George P. Rauchwerger, c/o Aqua-Knight, 147 Cromart Court, Sunnyvale, Calif.

Filed Nov. 20, 1968, Ser. No. 777,219
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **11 Claims**



A meter for measuring moisture in soil electronically uses two probes spaced apart with soil between the probes. The probes may be insulated plates of metal or flat insulated cable made of a plurality of conductors. The circuit has an ultrasonic oscillator which transmits a signal to the probes, which function as a variable capacitor depending upon moisture content of the soil. An integrated-circuit peak detector provides a positive DC voltage proportional to input peak voltage, and its output is measured by a microammeter which thus measures moisture. The output of the detector may be used to control an irrigation valve. Several probes and valves may be used in a system. The soil may be contained in a plastic bag and the electrodes applied to opposite sides of the bag.

3,626,287

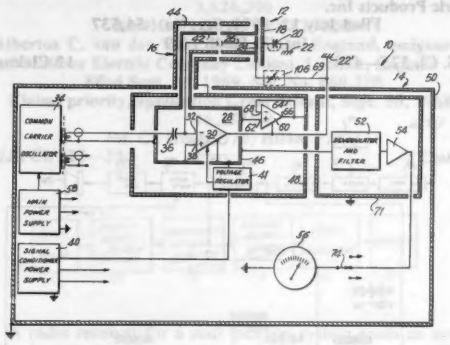
SYSTEM FOR RESPONDING TO CHANGES IN CAPACITANCE OF A SENSING CAPACITOR

Anthony J. Di Niro, Bergen County, N.J., assignor to C.G.I. Corporation, Hackensack, N.J.

Filed Feb. 10, 1969, Ser. No. 797,788
Int. Cl. G01r *27/26*
U.S. Cl. 324—61 R **7 Claims**

Capacitive transducer system utilizing capacitive probe connected in feedback loop of operational amplifier provided

with shielding system to convert capacitive changes at the probe to linear voltage changes for display by a voltmeter



with the system being isolated and shielded from the effects of stray capacity.

3,626,288

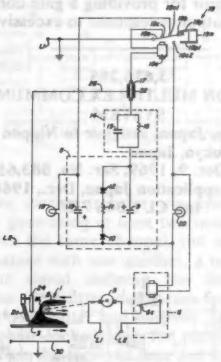
APPARATUS FOR DETECTING CONDUCTIVE MATERIAL UTILIZING A VAPOR LAMP

Victor R. Bart, 2527 Riverside Drive, East Gary, Ind.

Continuation-in-part of application Ser. No. 721,972, Apr. 17, 1968, now abandoned. This application Oct. 27, 1969, Ser. No. 869,804

Int. Cl. G01n *27/00*

U.S. Cl. 324—71 R **8 Claims**



A proximity or a probe contact control for a conveyor carrying electrically conductive material has a shielded fluorescent lamp, a sensing probe connected to the shield, a direct current plate potential charging means for the lamp, a discharge circuit connected in series with the lamp, a relay means responsive to the discharge circuit wherein the static bias on the lamp shield is changed by the change in level of conductive material initiating current flow in the lamp to actuate responsive relay means.

3,626,289

FRONT PANEL TRIGGER LAMPS

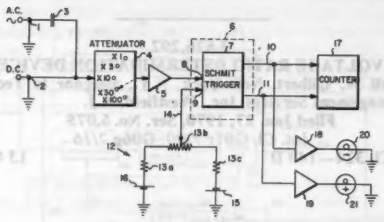
Neal W. Vinson, and Eugene P. De Rosa, both of Oakland, Calif., assignors to Beckman Instruments Inc.

Filed Sept. 14, 1967, Ser. No. 667,755

Int. Cl. G01r *31/00, 19/14*

U.S. Cl. 324—96 **12 Claims**

A pair of incandescent lamps coupled to the output of a trigger circuit included in the input channel of an electronic measuring instrument. The trigger circuit is actuated by an input signal to provide a pair of complementary output signals wherein each output signal is characterized by a duty cycle which is a function of the relative amplitudes of the



input signal and a threshold voltage which is applied to the trigger circuit. Each lamp is adapted to monitor one of the complementary output signals and emit visible light having a radiant intensity which is a function of the duty cycle of the output signal.

3,626,290

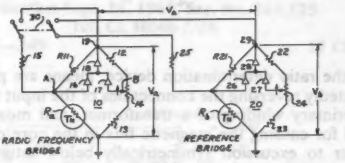
HIGH-FREQUENCY POWER MEASURING CIRCUIT EMPLOYING TWO SELF-BALANCING BRIDGES

Edward E. Aslan, Plainview, N.Y., assignor to The Narda Microwave Corporation, Plainview, N.Y.

Filed Nov. 30, 1967, Ser. No. 686,914

Int. Cl. G01r *5/26, 21/00*

U.S. Cl. 324—106 **7 Claims**



A high-precision circuit for measuring radiofrequency power by the direct current substitution method, wherein two self-balancing bridges are used; the first bridge containing a thermistor subjected to the radiofrequency power, and the second bridge containing a reference thermistor for establishing a temperature-compensated reference level.

3,626,291

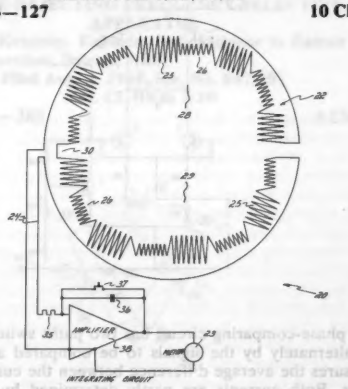
CURRENT-MEASURING APPARATUS

Donald W. Yauch, and Paul A. Lilie, both of Columbus, Ohio, assignors to Halmar Electronics, Incorporated, Columbus, Ohio

Filed May 12, 1969, Ser. No. 823,909

Int. Cl. G01r *1/22, 33/00*

U.S. Cl. 324—127 **10 Claims**



Apparatus including a set of adjacent coils which form a closed path adapted to be closed about a current-carrying

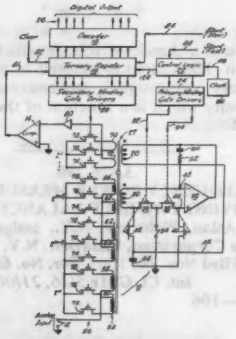
conductor. The voltage output from said coil, which is induced by the closing movement or by changes in the conductor current, is integrated. The integrated value of said voltage being proportional to the current flowing through said conductor.

3,626,292

VOLTAGE RATIO DETERMINATION DEVICE

Roswell W. Gilbert, New York, N.Y., assignor to Technical Management Services, Inc., Westfield, N.J.

Filed Jan. 27, 1970, Ser. No. 6,075
Int. Cl. G01r 7/00; G06g 7/16
U.S. Cl. 324—140 D 13 Claims



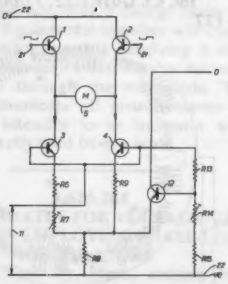
In the ratio determination device, means are provided for repeatedly reversing the connections of the input terminals to the primary winding of a transformer, and means are provided for causing the magnetic flux in the core of the transformer to excursion symmetrically below saturation level, thus enabling operation with DC input signals.

3,626,293

CIRCUIT FOR INDICATING VARIATIONS IN MARK-TO-SPACE RATIO

Stuart Alexander Andrews, Elstree, and Morgan Wynne Lewis, Bushey Heath, both of England, assignors to Rolls-Royce Limited, Derby, England

Continuation of application Ser. No. 681,875, Nov. 11, 1967, now abandoned. This application May 27, 1970, Ser. No. 41,721. Claims priority application, Great Britian, 50,218/66
Int. Cl. G01r 7/00, 25/00
U.S. Cl. 324—140 D 3 Claims



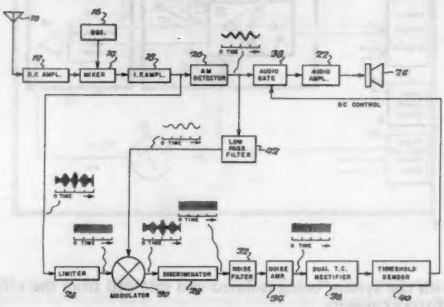
A phase-comparing circuit has two paths switched on and off alternately by the signals to be compared and a meter measures the average difference between the currents in the paths. Both currents are partly determined by a common transistor and by a respective transistor in the two paths, and temperature changes affect the three transistors equally to give temperature compensation to the meter reading.

3,626,294

CARRIER-PLUS-NOISE TO NOISE-OPERATED AM SQUELCH CIRCUIT

Charles H. Dancy, Getzville, N.Y., assignor to Sylvania Electric Products Inc.

Filed July 13, 1970, Ser. No. 54,537
Int. Cl. H04b 1/10
U.S. Cl. 325—478 12 Claims



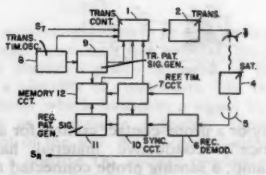
In an AM radio receiver including a mixer, IF amplifier, detector and audio output section, a squelch circuit which operates on the basis of a synchronously averaged carrier-plus-noise to noise ratio sensing of the received signal. The squelch circuit comprises a signal amplitude limiter and a discriminator for processing the IF output signal to derive noise power inversely related to received carrier power. An amplitude modulator is provided at the input, output or bias source of the discriminator for synchronously modulating the derived noise power in response to the demodulated signal output of the detector. This modulated noise power is then processed through a noise filter, a dual time constant rectifier and a threshold sensor for providing a gate control signal for muting the audio output in response to excessive noise.

3,626,295

TIME DIVISION MULTIPLEX COMMUNICATION SYSTEM

Akio Sabrui, Tokyo, Japan, assignor to Nippon Electric Company, Limited, Tokyo, Japan

Filed Dec. 9, 1969, Ser. No. 883,659
Claims priority, application Japan, Dec., 1968, 43/90799
Int. Cl. H04b 7/20
U.S. Cl. 325—4 7 Claims



A time division multiple access communication system including earth stations and a satellite station wherein each earth station includes a paired transmitter and receiver for acquisition and burst synchronization; the transmitter sending first pattern signals, each identifying the start of one signaling frame including a plurality of frequency slots divided on a time basis to identify each earth station, to the satellite for reception and retransmission to the earth stations; the receiver deriving a reference time point from each received first pattern signal, for generating second pattern signals; detecting a time difference between time periods of the first and second pattern signals including a polarity indication of such difference; algebraically adding signals representing such time difference and polarity, a preassigned time interval during which the signal burst is to be trans-

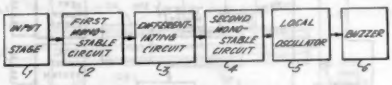
mitted, and the one signal frame and time position therein at which the signal burst is to be transmitted.

3,626,296

RADIO PAGING RECEIVERS

Albertus C. van der Veen, Gillingham, England, assignor to Multitone Electric Company Limited, London, England

Filed Sept. 23, 1969, Ser. No. 860,378
Claims priority, application Great Britain, Sept. 30, 1968, 46,357/68
Int. Cl. H04b 1/16; H04m 11/02
U.S. Cl. 325—55 2 Claims



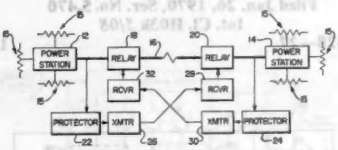
A radio receiver for a staff location system emits an audible alerting signal in response to, but subsequent to a calling signal, thereby avoiding interaction between the input and output circuits. The duration of the alerting signal is determined by the period of a monostable circuit.

3,626,297

TRANSFER TRIP SYSTEM USING QUADRATURE CARRIER MODULATION WITH COHERENT DETECTION

Stanley A. Green, Marlboro, and David A. Trutt, Newark, both of N.J., assignors to Quindar Electronics, Inc., Springfield, N.J.

Filed Dec. 11, 1969, Ser. No. 884,075
Int. Cl. H04b 3/00
U.S. Cl. 325—60 10 Claims



A quadrature carrier transfer trip system comprising a transmitter for generating at least two independent information signals over the same channel, the information signals being in quadrature with one another, a receiver for providing an output signal defining the information signals generated by the transmitter, and means for communicatively connecting the transmitter and receiver. The receiver is provided with a phase-locked loop for recovering the correct carrier signal from the received data and holding this correct carrier while a trip signal is being generated by the transmitter.

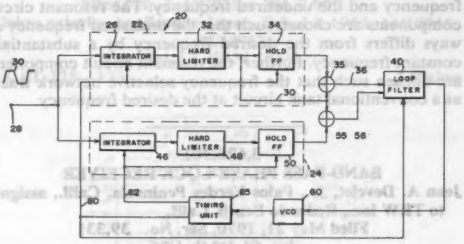
3,626,298

TRANSITION TRACKING BIT SYNCHRONIZATION SYSTEM

T. O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of; Tage O. Anderson, Arcadia; William J. Hurd, La Canada, and William C. Lindsey, Highland, all of Calif.

Filed July 8, 1969, Ser. No. 839,934
Int. Cl. H04b 7/18, 7/20; H04l 7/02
U.S. Cl. 325—321 20 Claims

A bit synchronization system, incorporating a digital data transition tracking phase-locked loop. The system, to which an input signal in the form of a noise-distorted constant amplitude bipolar stream of data bits, is assumed to be supplied, includes two integration channels. In one channel integrations are performed over assumed bit times, each bit time being equal to a bit period, while in the other channel integrations are performed over integration windows, each window being less than a bit period. The outputs of the two channels are combined to provide a pair of binary signals which are supplied to a digital filter, comprising a variable length counter and a variable gain register. The contents of two registers are combined to provide an error signal indicative of the direction of the phase difference between periods of bits in said stream and the assumed bit times.

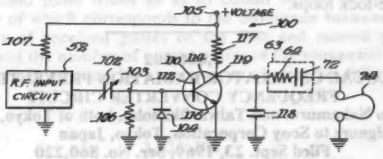


3,626,299

FM RECEIVING NETWORK

Leonard E. Hedlund, Omaha, Nebr., assignor to McMartin Industries, Inc., Omaha, Nebr.

Continuation-in-part of application Ser. No. 702,424, Feb. 1, 1968, now abandoned, Continuation-in-part of application Ser. No. 408,216, Nov. 2, 1964, now abandoned. This application Sept. 25, 1969, Ser. No. 861,125
Int. Cl. H04b 1/16
U.S. Cl. 325—349 17 Claims



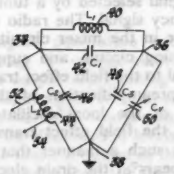
A receiving network for converting an FM radiofrequency input signal to a corresponding AM output signal including a selective radiofrequency input circuit coupled to a demodulator circuit having no inductive elements. The demodulator circuit comprises a diode rectifier and transistor coupled to a resistor-capacitor circuit.

3,626,300

IMAGE-REJECTING FREQUENCY SELECTIVE APPARATUS

Richard A. Kennedy, Kokomo, Ind., assignor to Detroit Motors Corporation, Detroit, Mich.

Filed Aug. 4, 1969, Ser. No. 847,291
Int. Cl. H03h 7/10
U.S. Cl. 325—388 4 Claims



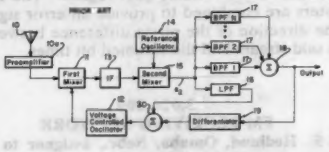
A frequency-selective network includes a circuit parallel resonant at a desired frequency for effectively transmitting signals at the desired frequency and a circuit series resonant

at an undesired frequency for effectively attenuating signals at the undesired frequency. A variable tuning capacitor is connected in both the parallel resonant circuit and the series resonant circuit for selectively determining the desired frequency and the undesired frequency. The resonant circuit components are chosen such that the undesired frequency always differs from the desired frequency by a substantially constant frequency. Further, the resonant circuit components are chosen such that the frequency selective network tracks as a conventional tank circuit at the desired frequency.

3,626,301
BAND-PASS PHASE-LOCK RECEIVER

Jean A. Develet, Jr., Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 21, 1970, Ser. No. 39,331
Int. Cl. H04b *1/26*
U.S. Cl. 325—420 **11 Claims**

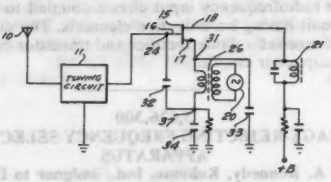


A band-pass phase-lock loop receiver which can receive phase or frequency modulated signals in the presence of noise at lower signal power levels than conventional low-pass phase-lock loops. The circuit includes a plurality of band-pass filters, one for each discrete portion of the spectrum, in addition to the single low-pass filter found in conventional phase-lock loops.

3,626,302
LOCAL OSCILLATOR RADIATION PREVENTING FREQUENCY CONVERTER CIRCUIT

Hideo Nakamura, and Taiwa Okanobu, both of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Sept. 23, 1969, Ser. No. 860,220
Int. Cl. H04b *1/12*
U.S. Cl. 325—436 **4 Claims**

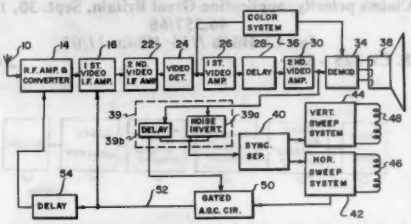


A radio receiver having an improved signal to noise ratio and diminished cross modulation and interference wherein the local oscillator cooperates with a mixer circuit to change a radiofrequency signal selected by a tuning circuit into an intermediate frequency signal. The radio receiver utilizes a field effect transistor in the mixer circuit and only passive elements in the tuning circuit, and supplies the selected radiofrequency signal to the field effect transistor at the gate electrode, without preamplification of the radiofrequency signal. The output of the local oscillator is supplied to another terminal of the field effect transistor, namely the source electrode, in such a manner that the intermediate frequency signal appears at the drain electrode of the field effect transistor with improved signal to noise ratio and diminished cross modulation and interference. A balanced impedance bridge is associated with the field effect transistor and the local oscillator in order to prevent leakage to the antenna of the local oscillator signal and thereby avoid radiation of this signal by the antenna.

3,626,303
NOISE INVERSION CIRCUIT

Milton E. Wilcox, Mesa, Ariz., assignor to Motorola, Inc., Franklin Park, Ill.

Filed Sept. 3, 1970, Ser. No. 69,353
Int. Cl. H04b *1/12*
U.S. Cl. 325—474 **14 Claims**

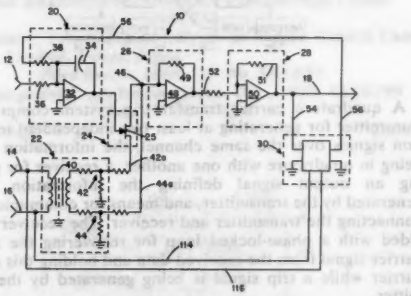


A noise inverter for use in a television receiver includes an input circuit for applying the composite video signal to a delay circuit and to a noise inverter gate, in the form of a PNP transistor, having a conduction threshold established by a storage capacitor. When the gate transistor is rendered conductive in response to noise pulses of sufficient magnitude, a clamping circuit driven by the gate operation to clamp the delayed composite signal to a predetermined magnitude. The discharge time of the capacitor establishes the maximum time interval the noise inverter is operative for prolonged signals exceeding the noise threshold.

3,626,304
LINEAR DC TO AC CONVERTER

Gary A. Wallen, Belmont, Mich., assignor to Lear Siegler, Inc., Grand Rapids, Mich.

Filed Jan. 26, 1970, Ser. No. 5,470
Int. Cl. H03k *5/08*
U.S. Cl. 328—27 **15 Claims**

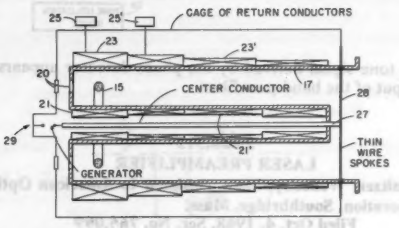


A DC to AC converter network in which a control signal produced by summing input DC with a network DC feedback signal, the control signal then being integrated and used to control the gate of a field effect transistor to operate the same as a variable resistance. A phase-splitter circuit provides out-of-phase AC components from an AC reference signal, and one of the components so produced is coupled to the other through the field effect transistor, to produce a resultant AC output whose phase and amplitude differ from the reference AC signal as a function of the integrated DC control signal. The resultant AC signal is fed to an amplifier and summed at the input thereof with a feedback signal from the amplifier output, and the latter is further amplified and fed to a phase-sensitive demodulator, to which the AC reference signal is also coupled. The demodulator output comprises the network feedback signal which is summed with the input DC, such that the amplified resultant AC signal is tied to the network input and will linearly follow the DC input signal.

3,626,305
HIGH ENERGY ION ACCELERATOR

Harold P. Furth, and Marshall N. Rosenbluth, both of Princeton, N.J., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Jan. 27, 1969, Ser. No. 794,314
Int. Cl. H01j *1/50;* H05h *1/00*
U.S. Cl. 328—233 2 Claims

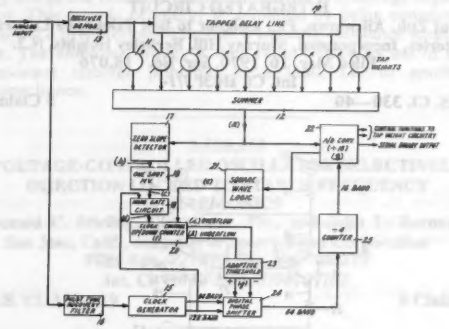


Static field accelerator for transferring energy from an electron ring to ions confined therein whereby the ions are efficiently accelerated to high energies in a short distance.

3,626,306
AUTOMATIC BAUD SYNCHRONIZER

Charles McD. Puckette, Scotia, N.Y., assignor to General Electric Company

Filed Oct. 23, 1969, Ser. No. 868,701
Int. Cl. H03k *13/02*
U.S. Cl. 328—72 15 Claims

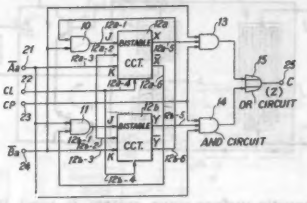


A method and circuit for synchronizing the receiver-sampling pulse train with a received analog data waveform in the receiver analog-to-digital converter in a synchronous data communication system utilizes the average time of occurrence of the zero slope points of the received waveform to obtain the synchronous condition. A zero-slope detector detects the points of zero slope and each detected zero slope passes a clock pulse of repetition rate higher than the sampling pulse train rate to an up-down counter. The receiver time base in square waveform controls the count direction of the counter, and successively repeated overflows (or underflows) of the counter add (or inhibit) single pulses to a digital phase shifter which shifts by a small fractional period the receiver time base waveform and the sampling pulse train in the proper direction for synchronization with the received analog data waveform.

3,626,307
COUNTING SYSTEM FOR MEASURING A DIFFERENCE BETWEEN FREQUENCIES OF TWO SIGNALS

Morito Koyama, Tokyo, Japan, assignor to Iwasaki Tsushinki Kaisha (a/k/a Iwatsu Electric Co., Ltd.), Tokyo-to, Japan

Filed Feb. 2, 1970, Ser. No. 7,905
Claims priority, application Japan, Feb. 14, 1969, 44/10916
44/10917
Int. Cl. H03d *13/00*
U.S. Cl. 328—133 3 Claims

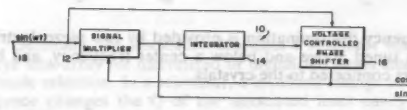


A counting system for measuring a difference between respective frequencies of the first input signal and the second input signal, where the first and second input signals are converted to a first pulse train whose pulses are each timed with each of the cycles of the first input signal and to a second pulse train whose pulses are each timed with each of the cycles of the second input signal; the first pulse train and the second pulse train are applied to a sequential logical circuit having three possible states to generate an output pulse in response to every received pulse of at least one of the first and second pulse trains so as to obtain output pulses the number of which corresponds to the difference between the numbers of received pulses of the first and second pulse trains; and the number of output pulses of the sequential logical circuit is counted by a counter to obtain the difference desired.

3,626,308
WIDE-BAND DOUBLER AND SINE WAVE QUADRATURE GENERATOR

Thomas O. Paine, Administrator of the National Aeronautics and Space Administration with respect to an invention of, and Robert B. Crow, Sierra Madre, Calif.

Filed Dec. 23, 1969, Ser. No. 887,685
Int. Cl. H03b *1/04*
U.S. Cl. 328—166 9 Claims

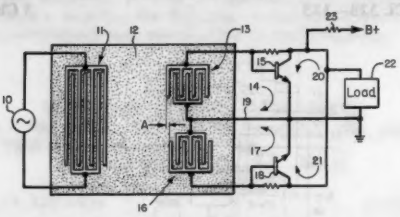


A wide-band signal quadrature and second harmonic generator comprising a voltage-controlled phase shifter which provides an output representing a phase-shifted sine input signal. The input signal and the phase shifter's output are multiplied by a multiplier whose output, after integration, is used to control the illumination levels of photoresistors in the phase shifter so that the output of the phase shifter is the cosine of the sine input signal. The multiplier's output when phase lock is achieved is the second harmonic of the sine input signal. The photoresistors in the phase shifter have large dynamic ranges of resistance changes to enable the generator to operate over a wide band of input signal frequencies.

3,626,309
SIGNAL TRANSMISSION SYSTEM EMPLOYING ELECTROACOUSTIC FILTER

Terence John Knowles, Oak Park, Ill., assignor to Zenith Radio Corporation, Chicago, Ill.

Filed Jan. 12, 1970, Ser. No. 2,015
Int. Cl. H03d 3/16
U.S. Cl. 329—117 **4 Claims**

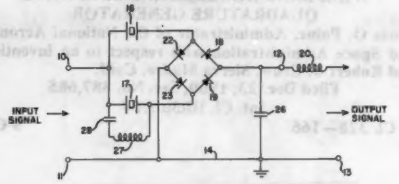


An acoustic-surface-wave system is used in coupling a signal source to a load. This system comprises an acoustic wave propagating medium with a single transducer at one end and at least a pair of transducers at the other. One end constitutes the input which connects to a signal source and the other connects to a load. A matrix including a pair of variable gain amplifiers couples the pair of transducers to its assigned terminal apparatus and controls the relative amplitudes of the signals transmitted by this transducer pair in determining the amplitude-frequency response of the system. Further control of the response characteristic is available by using unequal spacing along the medium of the members of the transducer pair relative to the aforesaid single transducer. The acoustic-surface-wave system is also used in a unique frequency-modulation detector and also in neutralizing feedback in transistor amplifiers.

3,626,310
FREQUENCY DISCRIMINATOR

Junior I. Rhodes, Lynchburg, Va., assignor to General Electric Company

Filed Mar. 6, 1970, Ser. No. 17,249
Int. Cl. H03d 3/16
U.S. Cl. 329—117 **12 Claims**



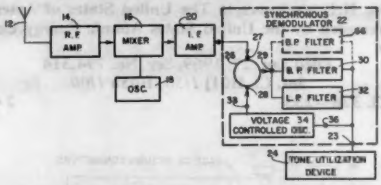
Frequency discrimination is provided by two piezoelectric crystals tuned above and below a center frequency, and by rectifiers connected to the crystals.

3,626,311
PHASE LOCK LOOP DEMODULATOR PROVIDING NOISE SUPPRESSION

Albert V. Kraybill, Riverside, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed July 30, 1970, Ser. No. 59,530
Int. Cl. H03d 3/18, 3/24
U.S. Cl. 329—122 **7 Claims**

A synchronous tone demodulator is comprised of a phase detector, a band-pass filter at the frequency of the desired tone and a low pass filter connected with a voltage-controlled oscillator in a feedback loop from the output of the phase detector to one of two inputs thereof. A carrier wave which is frequency or phase modulated by the tone is applied to the other input of the phase detector. Because the bandwidth of the feedback loop is limited by the filters, noise signals of frequencies outside of the band-pass of the filters are attenuated, thereby allowing the loop to lock even though the signal-to-noise ratio of the modulated wave is low. The

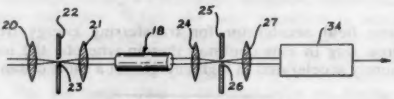


desired tone signal derived by the phase detector appears at the output of the band-pass filter.

3,626,312
LASER PREAMPLIFIER

Elias Snitzer, Wellesley, Mass., assignor to American Optical Corporation, Southbridge, Mass.

Filed Oct. 4, 1968, Ser. No. 765,099
Int. Cl. H01s 3/02
U.S. Cl. 330—4.3 **10 Claims**

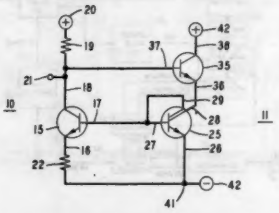


A light energy detector which includes a laser preamplifier coupled to means for converting the amplified light into electrical energy is provided. The detector is capable of detecting 1.06 micron wavelength light and is capable of detecting a minimum signal of approximately 1,000 photons or less at a duration of 50 nanoseconds or less.

3,626,313
CLASS AB AMPLIFIER FOR MONOLITHIC INTEGRATED CIRCUIT

Paul Zuk, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Mar. 10, 1970, Ser. No. 18,076
Int. Cl. H03f 3/14
U.S. Cl. 330—40 **5 Claims**



A transistor amplifier circuit for class AB operation having a low current in the quiescent state but high in the amplifying state as determined by the difference in emitter areas of two of the three transistors and the magnitude of a control resistor. The current amplification thus is independent of the beta of the transistors and all transistors are of the same conductivity type.

The input branch contains a control transistor having a large area emitter connected through a control resistor to a common terminal. Also connected to the common terminal is the proportionately smaller area emitter of a current gain transistor whose collector in turn is connected to the emitter of a voltage amplitude control transistor likewise in the output branch. The bases of the control and current gain transistors are directly interconnected and bypass connection short circuits the base-collector PN junction of the current gain transistor.

3,626,314

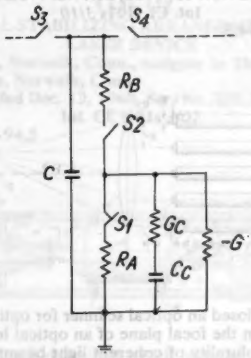
RESONANT TRANSFER EMPLOYING NEGATIVE RESISTANCE AMPLIFIERS

Joseph Antonius Broux, Antwerp, Belgium, assignor to International Standard Electric Corporation, New York, N.Y.

Continuation of application Ser. No. 625,519, Mar. 23, 1967, now abandoned. This application Feb. 26, 1970, Ser. No. 14,768. Claims priority, application Netherlands 6604008

Int. Cl. H03f 15/00

U.S. Cl. 330—61 A 5 Claims



A sample of energy representing information is transferred, by use of the resonant transfer principle, to a storage capacitor. This sample of energy is amplified by being connected during a predetermined time to a negative resistance amplifier. The amplified energy is then retransferred by use of the resonant transfer principle to a load, i.e. to another capacitance.

3,626,315

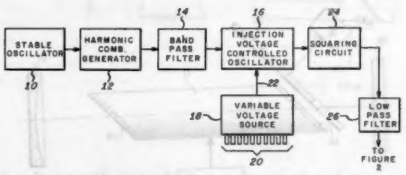
VOLTAGE-CONTROLLED OSCILLATOR SELECTIVELY INJECTION LOCKED TO STABLE FREQUENCY HARMONICS

Ronald C. Stirling, Clearwater, Fla., and John L. Barnum, San Jose, Calif., assignors to Sperry Rand Corporation

Filed Apr. 7, 1970, Ser. No. 26,273

Int. Cl. H03b 3/06, 3/08, 21/02

U.S. Cl. 331—19 8 Claims



A signal source and harmonic signal selector for application in frequency-coherent signal generators or synthesizers and in precision radio communication systems features a novel frequency conversion process to obtain pluralities of selectable stable frequency signals from one source. A stable oscillator is employed to excite the desired plurality of signals in a harmonic comb generator. An injection oscillator, controlled by a selected unidirectional voltage level, is used as a filter to select a desired one of the array of harmonically related signals. Means are provided for purifying the spectrum of the selected output signal.

3,626,316

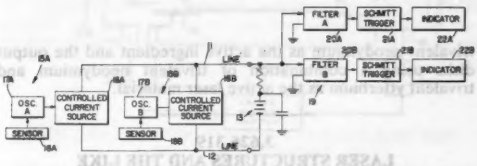
SIGNALLING DEVICE

Raymond S. Connell, Jr., Adelphi, Md., assignor to H. B. Engineering, Silver Springs, Md.

Filed Dec. 31, 1969, Ser. No. 889,538

Int. Cl. H03b

U.S. Cl. 331—56 16 Claims



A controlled current signalling device for use with transmission lines, said device including a current source adapted to be coupled across the transmission lines and having a high output impedance in comparison to the impedance of transmission lines and modulation means adapted to modulate the current source in accordance with a sensed input signal, said current source adapted to maintain its high output impedance during modulation thereof.

3,626,317

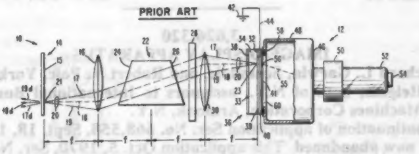
DIGITALIZED SCANLASER

Mark L. Dakss, Yonkers; Richard L. Garwin, Scarsdale, and Robert V. Pole, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 19, 1970, Ser. No. 12,789

Int. Cl. H01s 3/00; G02f 1/22

U.S. Cl. 331—94.5 27 Claims



Generally, the disclosure describes a scanlaser with a fly's eye lens array for discretized or digitalized beam steering via mode selection. In a scanlaser, a localized change in birefringence changes the Q of the associated laser cavity so that only certain modes can be sustained in the cavity. A scanlaser in accordance with this disclosure incorporates a fly's eye lens array which selects only one of the latter modes for lasing in the cavity.

3,626,318

TANDEM OSCILLATOR DISC AMPLIFIER WITH TRIVALENT NEODYMIUM INPUT DISC AND TRIVALENT NEODYMIUM PLUS YTTERBIUM OUTPUT DISCS

Charles Gilbert Young, Storrs, Conn., assignor to American Optical Corporation, Southbridge, Mass.

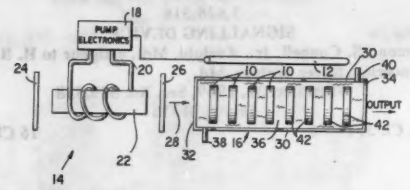
Filed Mar. 10, 1970, Ser. No. 18,265

Int. Cl. H01s 3/14

U.S. Cl. 331—94.5 6 Claims

A laser system is disclosed as including a conventional laser generator in tandem and in optical alignment with a laser amplifier, the laser amplifier having a series of laser disks disposed in parallel array in a laser cavity with a coo-

lant therein. The laser disks are arranged as amplifier input disks and amplifier output disks with the input disks using



trivalent neodymium as the active ingredient and the output disks using a combination of trivalent neodymium and trivalent ytterbium as the active laser material.

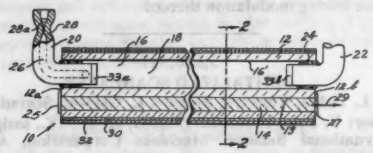
3,626,319
LASER STRUCTURES AND THE LIKE

Charles Gilbert Young, Storrs, Conn., assignor to Warner-Lambert Pharmaceutical Company, Morris Plains, N.J.

Continuation of application Ser. No. 539,041, Mar. 31, 1966, now abandoned. This application Apr. 14, 1970, Ser. No. 28,199

Int. Cl. H01s *3/04*

U.S. Cl. 331—94.5 **8 Claims**



A solid unitary laser structure of high optical and thermal efficiency comprising elongated rod of laser glass and elongated flash tube bore completely enclosed within cladding glass of predetermined characteristics.

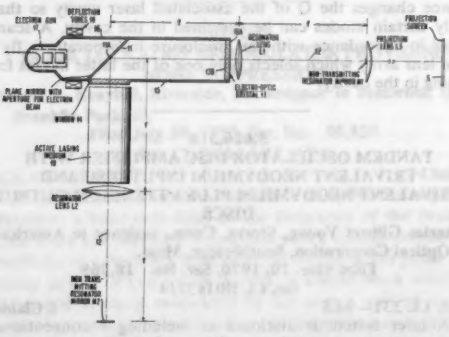
3,626,320
IMAGE DISPLAY APPARATUS

Richard L. Garwin, Scarsdale, and Robert V. Pole, Yorktown Heights, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation of application Ser. No. 668,558, Sept. 18, 1967, now abandoned. This application Oct. 5, 1970, Ser. No. 78,194

Int. Cl. H01s *3/05*; G02f *1/28*

U.S. Cl. 331—94.5 **3 Claims**



An electro-optic crystal sealed in a cathode-ray tube disposed between the end mirrors of a flat-field focusing laser cavity operates, when scanned by the modulated electron beam to vary the index of refraction of the crystal, to cause it to function as a controllable phase-modulating transducer in an optical system. The phase modulation distributes light into zero and side order beams. The cavity is so designed that it causes the side order light to escape from it, forming an intensity modulated image on a viewing screen in the manner of projection television, while the zero order light is reflected within the cavity to sustain the lasing action.

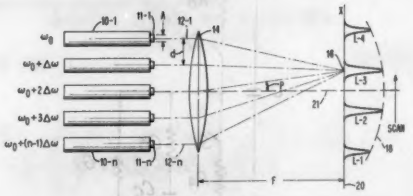
3,626,321
OPTICAL SCANNER AND METHOD FOR OPTICAL SCANNING

Archibald W. Smith, Briarcliff Manor, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1968, Ser. No. 775,363

Int. Cl. H01s *3/10*

U.S. Cl. 331—94.5 **14 Claims**



There is disclosed an optical scanner for optically scanning a target trace in the focal plane of an optical lens system. By establishing a plurality of coherent light beams with ordered geometrical intervals and frequency differentials from each other, the appropriate phase relationships are established for the beams to provide a moving interference pattern on the target trace. In particular, the source of the coherent beams alternatively may be a single beam laser whose consequent beam is caused by multiple reflections, diffractions, and transmissions to become an effective plurality of coherent beams or may be a multimode laser cavity whose beams are phase locked by the diffraction property of an acoustic wave medium. In particular, the diffraction of an incoming light beam by an acoustic wave obtains the requisite phase locking for the several interfering beams on the target trace.

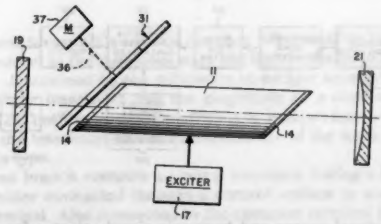
3,626,322
METHOD AND APPARATUS FOR ELIMINATING DOMINANCE OR LASER OSCILLATIONS AT ONE WAVELENGTH OVER THOSE AT ANOTHER

William M. Strouse, West Redding, Conn., and Irwin Tobias, New York, N.Y., assignors to American Optical Corporation, Southbridge, Mass.

Filed July 9, 1969, Ser. No. 840,302

Int. Cl. H01s *3/00*

U.S. Cl. 331—94.5 **2 Claims**



Method and apparatus for eliminating in a laser the dominance of laser oscillations at one wavelength of the laser medium over laser oscillations at another wavelength of said laser medium. The cavity of the laser is defined by two mirrors, at least one of which is spherically concave. Helium-neon gas has been mentioned as an example of one laser medium which may be used, and such acts more like a

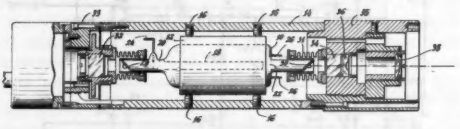
diverging lens upon laser oscillations at 6,401 A. than it does upon laser oscillations at 6,328 A. Because of this effect, if the effective optical spacing between the mirrors of a helium-neon laser is increased from a value at which diffraction losses are low and oscillations at 6,328 A. dominate, a point will be reached at which the diffraction losses for laser oscillations at 6,328 A. become great enough while the diffraction losses for laser oscillations at 6,401 A. remain small enough for laser oscillations at 6,401 A. only to occur. Accordingly, a method and apparatus for obtaining laser oscillations alternately at two closely related wavelengths of a laser medium or alternately at such wavelengths separated by oscillations at both wavelengths are disclosed and achieved by the proper spacing of the opposite mirrors and suitable optical path altering means therebetween.

3,626,323

THERMAL STABILIZING ARRANGEMENT FOR A LASER DEVICE

Beat Ineichen, Norwalk, Conn., assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Dec. 19, 1968, Ser. No. 785,279
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **8 Claims**



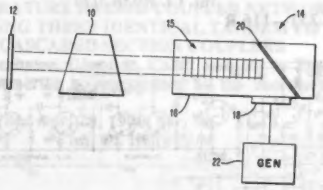
A laser device is described which includes a heat-generating body enclosing an optical transmission path and having a lasing material positioned in the path. A support housing is provided for the body and means are positioned about the body for cooling the body while substantially inhibiting the transfer of heat from the body to the housing. In this manner the body is maintained at a desirable operating temperature while the temperature of the housing is maintained substantially close to the ambient temperature of its surroundings.

3,626,324

VOLUME REFLECTOR FOR LASER CAVITIES

Eric G. Lean, Mahopac, and Robert A. Myers, New York, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.J.

Filed Oct. 27, 1969, Ser. No. 869,636
Int. Cl. H01s *3/05*
U.S. Cl. 331—94.5 **5 Claims**



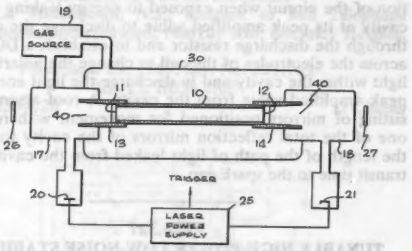
A volume reflector which may be employed as one or both of the end mirrors of a laser cavity. A laser cavity is provided including an active medium which is excited to produce stimulated emissions of light. A reflective means is located at each end of the cavity to reflect the light back into the cavity. One or both of the reflective means is an acoustic cell which is connected to a source of input signal, preferably at a microwave frequency. When particular relationships are satisfied, the light impinging on the acoustic cell is reflected back 180° by the standing acoustic wave fronts throughout the volume of the acoustic cell.

3,626,325

PULSED GAS LASER WITH RADIATION COOLING

Michael R. Smith, Thousand Oaks, Calif., assignor to BRITT Electronic Poducts Corporation, Santa Monica, Calif.

Filed Nov. 10, 1969, Ser. No. 875,316
Int. Cl. H01s *3/02*
U.S. Cl. 331—94.5 **15 Claims**



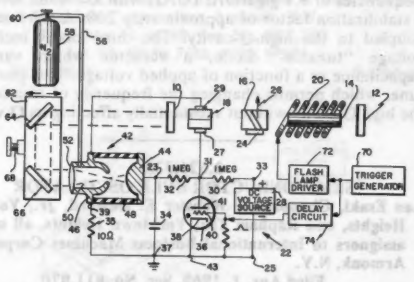
A pulsed gas laser having a ceramic tube in which lasing action takes place. The tube is surrounded by a glass envelope which forms a low-pressure environment around the tube so that the tube is cooled by thermal radiation. The tube is operable in a normal mode with a pulsing frequency in the range of 100 p.p.s. The tube is switchable to a burst mode in which the power input is increased tenfold to provide high average power output. Due to the radiation cooling even though the power input is increased tenfold and more, the tube's temperature only doubles remaining within safe limits for ceramic, and the gas density only changes by about 30 percent so that reasonable power output is obtained with any power input within the tenfold input range.

3,626,326

TIME-VARIABLE REFLECTIVITY LASER ACTUATING CIRCUIT

Ralph F. Wuerker, Palos Verdes Estates, and Robert A. Briones, Granada Hills, both of Calif., assignors to TRW, Inc., Redondo Beach, Calif.

Filed Dec. 8, 1969, Ser. No. 883,214
Int. Cl. H01s *3/09*
U.S. Cl. 331—94.5 **16 Claims**



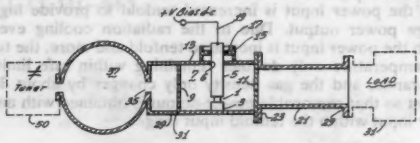
In a time-variable reflectivity laser of the type having a cavity, total reflection mirrors at the ends of the cavity, a ruby rod in the cavity for emitting radiation, a xenon lamp for pumping the ruby rod, a Glan polarizer in the cavity, a cell having electrodes in the cavity for changing the polarity of light, and apparatus for energizing the energy source and for energizing and deenergizing the cell in a predetermined sequence to discharge light from the cavity. The energizing apparatus consists of a trigger generator and a voltage source connected to the trigger generator and the energy source for pumping the ruby rod in response to the output from the trigger generator to establish a condition of excited atoms in the rod. Provided also is a DC voltage source, and a series circuit arrangement including a pair of resistors, a capacitor, and a discharge resistor, connecting the DC voltage source to the cell electrodes for charging the electrodes to a DC volt-

age to change the polarization of light within the cavity and to establish reduced reflectivity within the cavity. A delay circuit connected to the trigger generator is provided for generating a delayed-output signal. A thyratron tube circuit, which is responsive to the delayed output of the delayed circuit is utilized to short a portion of the circuit and to discharge the cell electrodes through the discharge resistor to thus deenergize the cell and to establish light amplification within the cavity. A spark gap is utilized to short another portion of the circuit when exposed to energy leaking from the cavity at its peak amplified value to discharge the capacitor through the discharge resistor and to establish a DC voltage across the electrodes of the cell to change the polarization of light within the cavity and to discharge the light energy at its peak amplified value from the cavity. A roof assembly consisting of mirrors positioned for movement with respect to one of the total reflection mirrors of the cavity for varying the length of the path of light leaked from the cavity and its transit time to the spark gap.

3,626,327
TUNABLE HIGH-POWER LOW-NOISE STABILIZED DIODE OSCILLATOR

Thomas Hugo Luchsinger, Belmont, and Walter Ransom Day, Jr., Menlo Park, both of Calif., assignors to Litton Precision Products, Inc., San Carlos, Calif.

Filed June 22, 1970, Ser. No. 48,296
Int. Cl. H03b 7/14
U.S. Cl. 331—107 R **9 Claims**

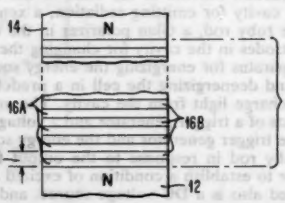


The invention disclosed is a tunable high-power low-noise stabilized frequency semiconductor diode oscillator unit which comprises a semiconductor diode, suitably a Gunn or Avalanche diode, located within a low-Q-resonant cavity for generating the carrier frequency, f_0, and another cavity, tuned to f_0 and having a very high-Q-relative to the first cavity, is tightly coupled to the low-Q-cavity. A microwave output passage in the low-Q-cavity is provided for connection of the oscillator output directly to a load; wherein the oscillator provides output powers in excess of 100 milliwatts at frequencies of 9.4 gigaHertz (GHz) with low-noise levels and a stabilization factor of approximately 200. A third cavity is coupled to the high-Q-cavity. The third cavity includes a voltage "tunable" diode, a varactor which varies in capacitance as a function of applied voltage. This provides a tuner which permits changing the frequency of resonance of the high Q cavity without substantially affecting its Q-value.

3,626,328
SEMICONDUCTOR BULK OSCILLATOR

Leo Esaki, Chappaqua; Webster E. Howard, Jr., Yorktown Heights, and Raphael Tsu, Yorktown Heights, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 1, 1969, Ser. No. 811,870
Int. Cl. H03b 7/06
U.S. Cl. 331—107 G **14 Claims**

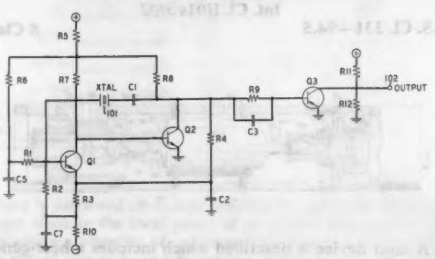


The semiconductor bulk oscillator includes a body of semiconductor material which includes a superlattice portion across which an electric field is applied. The device responds to this field to produce bulk high-frequency oscillations. The superlattice portion has a one-dimensional periodic spatial variation in its band edge energy produced either by doping or alloying. The periodic variation in band edge energy provides in wave vector space a plurality of minizones which are much smaller than the Brillouin zone. A cavity-type structure is formed transverse to the superlattice portion of the device to extract outputs of electromagnetic energy at high frequencies obtained when an electric field above threshold is applied across the superlattice.

3,626,329
CRYSTAL-CONTROLLED MULTIVIBRATOR OSCILLATOR

Glenn Edward Larson, Old Bridge, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed May 27, 1970, Ser. No. 40,937
Int. Cl. H03b 5/36; H03k 3/282
U.S. Cl. 331—113 R **10 Claims**

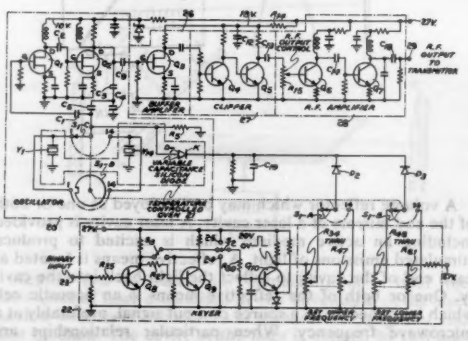


The frequency of a square wave transistor multivibrator oscillator is determined by a high-gain AC coupled quartz crystal feedback loop. Oscillator startup is provided by a DC coupled RC network feedback path which provides only sufficient gain to barely sustain oscillations. When power is turned on, the first-stage transistor is slowly biased through its linear region. The RC network thus provides a sinusoidal wave until energy at the resonant frequency of the crystal is produced, whereupon the crystal feedback path, which dominates, "takes over" and the multivibrator frequency becomes solely dependent upon the crystal.

3,626,330
CAPACITIVE DIODE CONTROLLED OSCILLATOR FREQUENCY SHIFT KEYING CIRCUIT

Robert A. Zalonis, South Plainfield, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 15, 1970, Ser. No. 3,147
Int. Cl. H03b 5/36
U.S. Cl. 331—116 R **1 Claim**



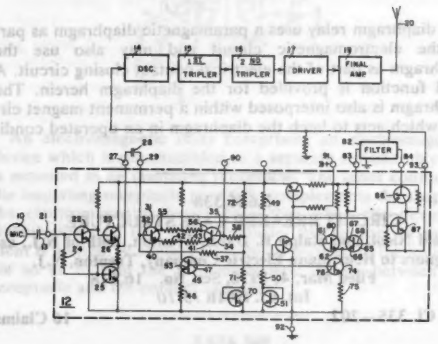
A crystal oscillator is shifted between two different discrete frequencies by means of two different voltages being

applied to a variable capacitance diode coupled in shunt relation with the crystal. The circuit providing one of the two different voltages having a given value is permanently connected to the diode to provide the lower frequency shift. The other of the two different voltages having a value greater than the given value is provided by a transistor stage under control of a binary signal. The binary signal controls the conduction and nonconduction of the transistor stage to selectively connect and disconnect the other of the two different voltages to the diode. This other higher voltage, and, therefore, the higher frequency shift, is provided only when the transistor stage is nonconductive, which occurs when the condition of the binary signal is low, and overcomes the voltage providing the lower frequency shift.

3,626,331
AUDIO SIGNAL PROCESSOR

Donald B. Burns, La Grange, Ill., assignor to Motorola, Inc., Franklin Park, Ill.

Filed June 8, 1970, Ser. No. 48,803
Int. Cl. H03c 3/08; H04b 1/04
U.S. Cl. 332—18 **13 Claims**

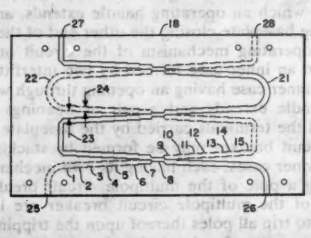


A modulating processing system for a phase or frequency modulated transmitter includes a differentiator and limiter for controlling the deviation of the modulated signal. The limiter includes a pair of emitter-coupled transistors alternately biased by an input signal between cutoff and conduction. A constant current source is coupled in series with the emitters of the limiter to maintain conduction at less than saturation and temperature compensation circuits are included to stabilize the operation of the system with temperature changes. The circuit is readily adapted to be formed as an integrated circuit.

3,626,332
QUADRATURE HYBRID COUPLER NETWORK COMPRISING THREE IDENTICAL TANDEM FIFTEEN CASCADED SECTION COUPLERS

Ronald P. Barbatoe, Glendale, Calif., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 23, 1970, Ser. No. 31,180
Int. Cl. H01p 5/14
U.S. Cl. 333—10 **1 Claim**

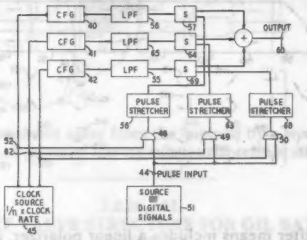


A quadrature hybrid coupler comprising three dielectric layers sandwiched between two backup plates. Positioned on both sides of the center dielectric layer are copper strips forming three identical tandem, fifteen cascaded section couplers. Each of the tandem couplers provide a perfect match to the next section.

3,626,333
AUTOMATIC EQUALIZER EMPLOYING BULK SEMICONDUCTOR DEVICES

Tingye Li, Middletown, N.J., assignor to Bell Telephone Laboratories Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Sept. 29, 1969, Ser. No. 861,761
Int. Cl. H03h 5/00
U.S. Cl. 333—28 **3 Claims**

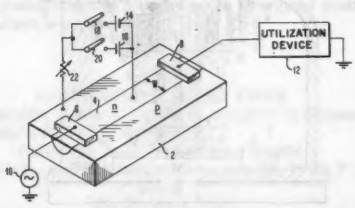


An automatic equalizer employing *n* controlled waveform generators each of which uses a bulk semiconductor device having a series of contacts bonded to the surface with resistors, connected between the contacts. Each such generator has a domain nucleated in the semiconductor device at 1/*n*th the clock rate and the filtered output of one of the generators is connected to an output terminal when the digital input signal received over the transmission system in a pulse. The result is that pulses are distorted over *n* slots so as to minimize intersymbol interference when the pulses are transmitted over a distorting transmission channel. In a preferred embodiment of the invention the resistors connected between the contacts are photoconductors so that an adjusting signal driving a light source may rapidly change the values of the resistors and thereby adjust the equalizer.

3,626,334
ELECTRICALLY VARIABLE ACOUSTIC DELAY LINE

Robert W. Keyes, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,200
Int. Cl. H03h 7/36, 9/00, 9/30
U.S. Cl. 333—30 R **9 Claims**



This invention relates to acoustic wave delay lines and, more particularly, to surface acoustic wave delay lines in nonpiezoelectric semiconductors in which the delay can be varied by application of an electrical signal.

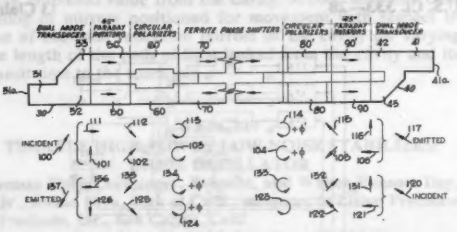
3,626,335
PHASE-SHIFTING MEANS

William E. Hord, and James A. Benet, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Nov. 10, 1969, Ser. No. 875,248
Int. Cl. H01p 1/18
U.S. Cl. 333—31 A **8 Claims**

A reciprocal latching phase-shifting device which accepts arbitrarily polarized electromagnetic wave energy. A first

dual mode transducer converts the incident wave energy into its two orthogonal components and passes each component into a separate waveguide section containing phase-shifter means. The two waveguides are joined at their remote ends by a second dual mode transducer for combining the phase-shifted orthogonal components. The first and second dual mode transducers are identical, and the position of the second transducer is inverted from that of the first. The vertical and horizontal components of the incident wave energy are therefore converted respectively to the horizontal and vertical components of the transmitted wave energy. Each



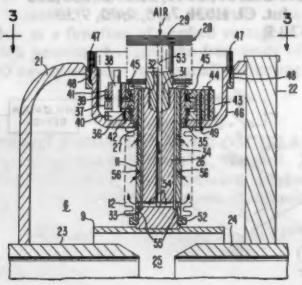
phase shifter means includes a linear polarizer, a 45° rotator, a quarter-wave plate, a ferrite phase shifter, a second quarter-wave plate, a second 45° rotator, and a second linear polarizer orthogonal to the first linear polarizer. The first and second waveguides are formed by plating directly onto the wave energy carrying material of the phase-shifting means. Ferrite shunts between the ferrite phase shifters in the first and second waveguides, at the ends of the ferrite phase shifters, form a closed magnetic circuit between the ferrite phase shifters, thereby allowing operation in a remanent state without the use of a magnetic yoke.

3,626,336

HEAT DISSIPATING STRUCTURE FOR CAVITY RESONATOR TUNING ACTUATOR

Martin E. Levin, Menlo Park, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed Apr. 13, 1970, Ser. No. 27,624
Int. Cl. H01p *7/06, 1/30*
U.S. Cl. 333—83 R **9 Claims**



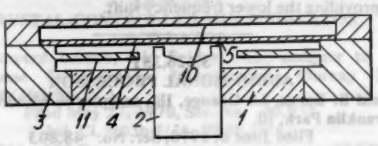
A tunable cavity resonator structure is disclosed having a tuning member movable within the cavity for tuning same. A tuner actuator structure is affixed to the tuning member and extends out of the cavity through an apertured wall thereof for effecting movement of the tuner. A thermally conductive stem, separate from the tuner actuator member, is affixed to the movable tuning member and extends out of the cavity through the apertured wall for conducting heat from the tuning member to the surrounds. The tuner actuator member is made of a material having a low coefficient of thermal expansion to eliminate temperature dependent tuning effects.

3,626,337

ELECTROMAGNETIC RELAY WITH PERMANENT MAGNET LATCHING

Harry Stanley Woodhead, Harlow, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed July 29, 1970, Ser. No. 59,047
Claims priority, application Great Britain, Sept. 18, 1969, 46,043/69
Int. Cl. H01h *1/00, 9/00*
U.S. Cl. 335—196 **13 Claims**



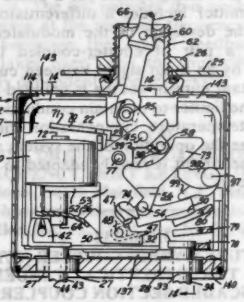
A diaphragm relay uses a paramagnetic diaphragm as part of the electromagnetic circuit and may also use the diaphragm as part of the electrical contact closing circuit. A third function is provided for the diaphragm herein. The diaphragm is also interposed within a permanent magnet circuit which acts to latch the diaphragm in an operated condition.

3,626,338

CIRCUIT BREAKER CASE STRUCTURE

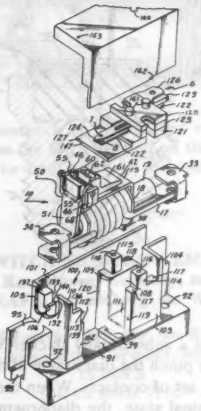
Ronald Nicol, and Ralph B. Davis, Trenton, both of N.J., assignors to Heinemann Electric Company, Trenton, N.J.

Filed Mar. 4, 1970, Ser. No. 16,518
Int. Cl. H01h *13/10*
U.S. Cl. 335—202 **16 Claims**



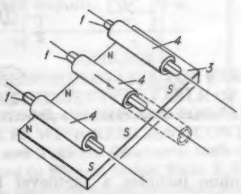
An electromagnetic circuit breaker for opening a set of contacts upon the occurrence of predetermined conditions, having an outer tubular casing closed at one end, but for a hole through which an operating handle extends, and a terminal-carrying baseplate closing the other end of the tubular casing. The operating mechanism of the circuit breaker is housed within an inner case formed by two interfitting case sections, the inner case having an opening through which the operating handle extends and a pair of openings through which extend the terminals carried by the baseplate. Also, a multipole circuit breaker may be formed by stacking, side-by-side, the inner cases, each having its own mechanism and each defining a pole of the multipole circuit breaker. The mechanisms of the multipole circuit breaker are interconnected so as to trip all poles thereof upon the tripping of any one pole, the multipole circuit breaker having a suitable larger outer casing and terminal carrying baseplate.

3,626,339
ELECTROMAGNETIC RELAY
Albert D. Lisnay, Trenton, N.J., assignor to Heinemann Electric Company, Trenton, N.J.
Filed Apr. 20, 1970, Ser. No. 30,076
Int. Cl. H01h 9/02
U.S. Cl. 335—202 **31 Claims**



An electromagnetic relay comprising an electromagnetic device which is preassembled as a separate subassembly and is mounted in an insulating receptacle. The inner contour of the insulating receptacle generally complements the shape of the electromagnetic device such that when the device is slidably inserted into the receptacle, its freedom of movement is limited. A contact assembly is secured to the receptacle so as to trap the electromagnetic device between the receptacle and the contact assembly.

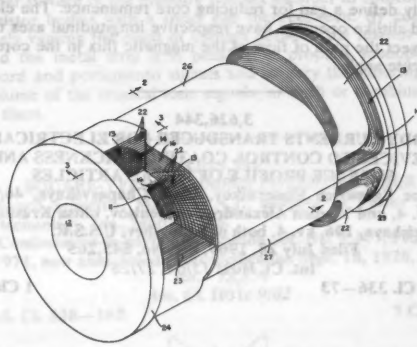
3,626,340
REED SWITCH ASSEMBLY EMPLOYING A MAGNETIC SCREEN
Frederick Percival Mason, Burgess Hill, and Vishwanath Bansal, Hove, both of England, assignors to Creed & Company Limited, Hollingbury, Brighton, England
Filed Apr. 13, 1970, Ser. No. 27,739
Claims priority, application Great Britain, Apr. 16, 1969, 19,337/69
Int. Cl. H01h 51/28
U.S. Cl. 335—205 **1 Claim**



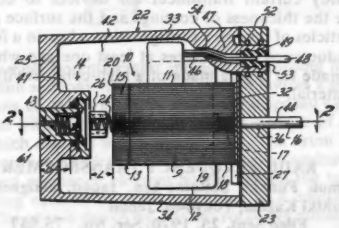
A reed switch (for example, for a keyboard controlling a transmitter) is controlled by a reciprocable high-permeability collar which can be slid axially onto the reed to screen the latter from a stationary magnet. This achieves low crosstalk and permits high-packing density.

3,626,341
ELECTROMAGNET STRUCTURE
James Dao, Alameda, Calif., assignor to Air Reduction Company, Incorporated, New York, N.Y.
Filed July 22, 1969, Ser. No. 843,420
Int. Cl. H01f 7/22
U.S. Cl. 335—216 **7 Claims**

An electromagnet structure is described for producing high-strength magnetic fields. Individual layers of electrical coil layers are stacked on a support and comprise a coil structure. Each of the coil layers is individually reinforced against displacement away from the support by a wound reinforcing layer of material having substantial tensile strength.

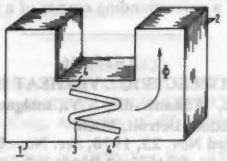


3,626,342
RELIEF VALVE STRUCTURE FOR OIL BATH SOLENOID
Robert H. Green, Grove City, Ohio, assignor to Abex Corporation, New York, N.Y.
Filed July 16, 1970, Ser. No. 55,522
Int. Cl. H01f 7/08
U.S. Cl. 335—257 **15 Claims**



An oil bath solenoid which has a relief valve mounted in the housing. The valve is so positioned in the housing and so structured that it functions (a) as a relief valve to relieve excessive oil pressure within the solenoid housing, (b) as a bumper for the solenoid's plunger when the plunger is moved to the deenergized position, and (c) as a reset device for manually positioning the plunger in the energized position if a power failure is experienced.

3,626,343
LAMINATED MAGNET CORE
Gunther Bohlke, Amberg, Germany, assignor to Siemens Aktiengesellschaft, Berlin, Germany
Filed Sept. 2, 1970, Ser. No. 69,001
Claims priority, application Germany, Jan. 28, 1970, P 20 03 643.5
Int. Cl. H01f 3/00
U.S. Cl. 335—281 **4 Claims**



A laminated magnet core for contactors and the like has a working airgap. The magnet core is made up of a stack of

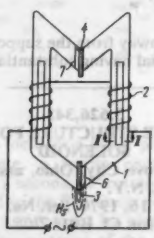
metal sheets that define a path of flow of magnetic flux through the core. The metal sheets have respective elongated slitlike openings extending across a portion of the width of the sheets. The openings at least partly overlapped and jointly define a gap for reducing core remanence. The elongated slitlike openings have respective longitudinal axes that intersect the path of flow of the magnetic flux in the core at an acute angle.

3,626,344

EDDY CURRENTS TRANSDUCER FOR ELECTRICAL DEVICES TO CONTROL COATING THICKNESS AND SURFACE PROFILE OF METAL ARTICLES

Viktor Egorovich Shaternikov, ulitsa Chapaevskaya, 46/70, kv. 4, and Vladlen Alexandrovich Denisov, ulitsa Krasnoarmeiskaya, 106, kv. 4, both of Kuibyshev, U.S.S.R.

Filed July 28, 1969, Ser. No. 845,265
Int. Cl. H01f *15/04, 27/28*
U.S. Cl. 336—73 **1 Claim**



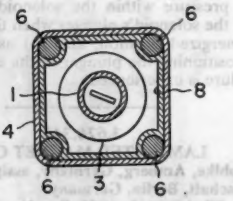
An eddy current transducer for devices to control and measure the thickness of coatings and the surface profiles of metal articles of complex configuration wherein a ferrite core of an inductance coil features at least one gap where provision is made for a plug made of a high-conductivity nonmagnetic material.

3,626,345

RADIOFREQUENCY TRANSFORMER

Kyuzaemon Funaki, Saitama-ken, Japan, assignor to Toko Kabushiki Kaisha, Tokyo-to, Japan

Filed Sept. 25, 1970, Ser. No. 75,557
Claims priority, application Japan, Oct. 13, 1969, 44/97356
Int. Cl. H01f *15/04*
U.S. Cl. 336—84 **7 Claims**



A radiofrequency transformer having a metal outer case of a given cross section for enclosing coils therein and has a magnetic shield comprising four rods of a magnetic material each interposed and held between a respective corner of the outer case and a corresponding corner of a rigid inner case.

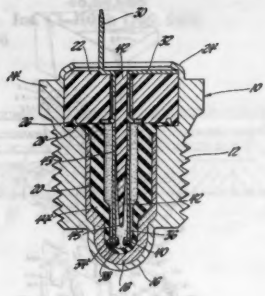
3,626,346

THERMOELECTRIC OVERHEAT INDICATOR

Lynn S. Brock, Williamsville, N.Y., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 23, 1970, Ser. No. 92,024
Int. Cl. G01k *5/52*; **H01h** *37/04, 37/46*
U.S. Cl. 337—393 **3 Claims**

An indicating device constructed as a switch that is adapted to fit into the block of an internal combustion engine and, in operation therein, will provide a signal relative to engine overheat. More particularly, this switch operates by expansion and contraction of a microcrystalline wax in accordance with temperature changes. The wax acts upon a generally tubular elastomeric diaphragm having a thin wall



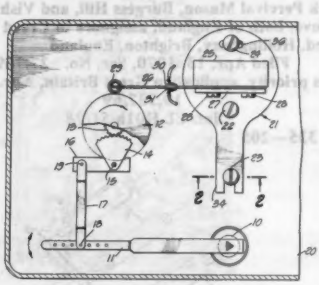
lower portion and a substantially thicker walled upper portion to collapse or pinch the diaphragm at the thin wall lower portion to close a set of contacts. When the wax contracts or returns to its original state, the diaphragm follows and also returns to its initial position and configuration.

3,626,347

FUNCTION GENERATOR COMPRISING A CAM-OPERATED LEAF SPRING WITH STRAIN GAUGES

Victor Lawford, Pasadena; Richard P. Granada, Covina, and Art M. D. Moen, Covina, all of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed June 11, 1969, Ser. No. 832,206
Int. Cl. G01l *1/22*
U.S. Cl. 338—4 **5 Claims**



The invention includes a cantilever leaf spring having strain gauges thereon. The leaf spring is bent by a cam. By using a cam of a particular configuration, the output of the strain gauges may be modified to represent any desired function of the cam angle. The leaf spring is mounted on a base which may be rotated to vary the spring deflection for a zero adjustment.

3,626,348

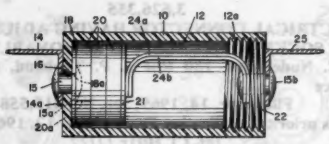
CURRENT-REGULATING APPARATUS

Ralph W. Alten, Detroit, Mich., assignor to Essex International Inc., Fort Wayne, Ind.

Filed Apr. 2, 1969, Ser. No. 812,642
Int. Cl. H01c *7/10*
U.S. Cl. 338—20 **17 Claims**

Apparatus for regulating the current in a circuit comprises a thermally sensitive bimetallic conductor exerting a force on

a plurality of stacked resistance elements, both the bimetallic conductor and the stacked elements forming conductive parts of the circuit. The force exerted by the bimetallic conductor varies in accordance with changes in its temperature.



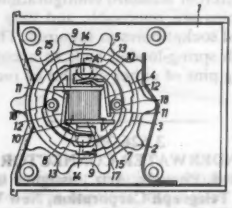
The effective resistance of the stacked resistance elements varies inversely to the force exerted on them. The bimetallic conductor may be one which is responsive to a threshold temperature.

3,626,349

SWITCHING ARRANGEMENT

Rudolf Hubrich, Ravensburg, Germany, assignor to Raimund Finsterholzl (RAFI), Ravensburg am Wurttemberg, Germany

Filed June 6, 1969, Ser. No. 831,157
Claims priority, application Germany, Mar. 25, 1969, P 19 15 009.5
Int. Cl. H01c 7/16
U.S. Cl. 338—32 **18 Claims**



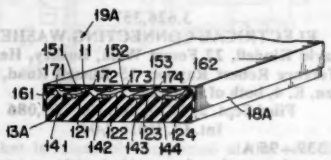
A switching arrangement for use in programming systems or the like wherein the hollow hub of a rotary selector accommodates a stack of coaxial ring-shaped cams whose lobes can pivot two-armed armatures mounted on the pole shoes of a fixed permanent magnet. The pole shoes carry semiconductors whose electrical resistance varies as a function of the intensity of the magnet field, and such intensity is changed in response to pivoting of armatures on rotation of the selector to predetermined angular positions. The semiconductors are connected in logical circuits.

3,626,350

VARIABLE RESISTOR DEVICE FOR ELECTRONIC MUSICAL INSTRUMENTS CAPABLE OF PLAYING MONOPHONIC, CHORD AND PORTAMENTO PERFORMANCES WITH RESILIENT CONTACT STRIPS

Shoichi Suzuki, and Takatosi Okumura, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Nakazawa-cho, Hamamatsu-shi, Shizuoka-ken, Japan

Filed Feb. 17, 1970, Ser. No. 11,983
Claims priority, application Japan, Feb. 20, 1969, 45/12442 45/14387, 45/12438, 45/14388
Int. Cl. H01c 9/02
U.S. Cl. 338—69 **7 Claims**



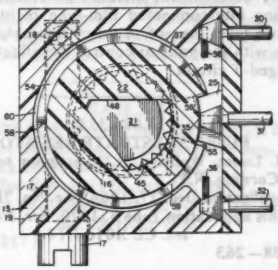
A variable resistor utilized as a keyboard of an electronic musical instrument is comprised of an elongated rectangular base member, a plurality of strip-shaped resistor bodies formed on one surface of the base member, a resilient pressure contact member covering resistor bodies and a plurality of mutually spaced apart strips of metal mounted on the inner surface of the pressure contact member to confront the resistor bodies with a small gap therebetween. By continuously varying the point of contact between the resistor body and the metal strip it is possible to produce monophonic chord and portamento signals and to vary the coloring and volume of the musical tone signals, or each or combinations of them.

3,626,351

SQUARE-TYPE TRIMMING POTENTIOMETER

Edward Schoettly, Madison, N.J., assignor to Vishay Intertechnology, Inc., Malvern, Pa.

Continuation-in-part of application Ser. No. 7,447, Feb. 2, 1971, now abandoned. This application Sept. 18, 1970, Ser. No. 73,579
Int. Cl. H01c 9/02
U.S. Cl. 338—162 **7 Claims**



A trimming potentiometer including a housing having top and bottom sections. The bottom section houses a gear which has on one of its flat surfaces a laterally disposed cam for engagement with a matching cam on one surface of a contact drum which also fits within the housing. The drum has on its reverse surface an electrical contact pressed against an arcuate-shaped resistance element housed within the top section and having each of its ends connected to a conductive terminal. The gear is driven by a worm rotatably mounted in the bottom section. Rotation of the worm drives the gear, which rotates the drum, causing the electrical contact to sweep across the arcuate-shaped resistance element. The drum has a stop that engages abutment edges on the housing to limit rotation of the drum so that the electrical contact will not go beyond the arcuate limit of the resistance element, usually 270° or so. If rotation of the screw is continued after the stop engages the abutment edges at either end of the range of rotation, the gear and screw are forced out of engagement with each other by camming action between the cam on the gear and the matching cam on the drum to prevent destruction of either the gear section or the thread surface of the worm. Within the bottom section is positioned a gear spring which will flex when the gear is forced out of position against it, but will keep the gear otherwise engaged with the screw. The drum is generally circular in shape and large enough to have one of its sides ordinarily pressed against a shoulder at the bottom section. Since the drum will rotate with the gear, unless otherwise provided, the drum will encounter large frictional forces when turning against the shoulder of the section. To reduce friction a wave spring is provided between the drum and the section shoulder.

3,626,352

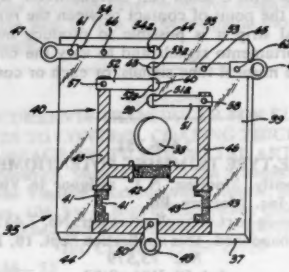
ATTENUATOR SWITCHES HAVING DEPOSITED LAYER-TYPE CIRCUITRY

Kenneth W. McCoig, Anaheim, Calif., assignor to Beckman Instruments, Inc.

Filed Apr. 6, 1970, Ser. No. 25,845
Int. Cl. H01c 9/04
U.S. Cl. 338—190 **18 Claims**

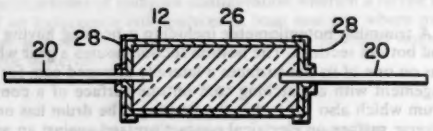
Attenuator switches having deposited layer-type resistors, conductors, and switch pads. In one embodiment, a step at-

tenuator comprises a plurality of π attenuator sections formed of resistive and conductive films disposed on stationary ceramic wafers. Relatively rotatable ceramic wafers carry conductive film switch pads which cooperate with switch contacts extending from the stationary wafers to



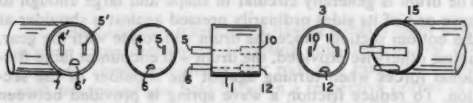
bypass or insert selected π sections into an electrical circuit. A bridged-T embodiment includes an electrically insulative wafer having interconnected film-type resistors and switch pads on both faces thereof. A set of rotatable wiper contacts cooperates with the pads to control the effective attenuation of the bridged-T circuit.

3,626,353
FUSED SUBSTRATE RESISTOR
Guenter H. Loose, Webster, N.Y., assignor to Corning Glass Works, Corning, N.Y.
Original application Dec. 27, 1968, Ser. No. 787,312. Divided and this application June 8, 1970, Ser. No. 44,236
Int. Cl. H01c *1/14*
U.S. Cl. 338—263 **5 Claims**



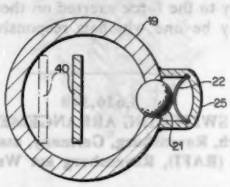
A capless electroconductive coating resistor. The resistor dielectric substrate is formed of particulate material by pressing or molding within which substrate wire leads are embedded. The green body so formed is fired to coalesce or sinter the particles and volatilize any organic constituents. Thereafter, an electroconductive coating is applied over the surface of the substrate in electrical contact with the leads.

3,626,354
POLARITY-REVERSING ADAPTER MEANS
Philip M. Banner, 28 Oxford Road, Massapequa, N.Y.
Filed Mar. 4, 1970, Ser. No. 16,477
Int. Cl. H01r *3/06*
U.S. Cl. 339—14 R **1 Claim**



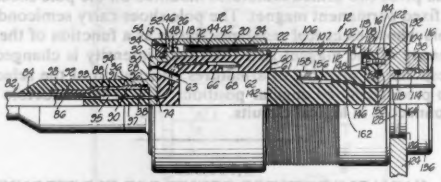
A polarity-reversing adapter for single-phase three-wire systems designed for supplying electric power to small boats, yachts, seaplanes, and other equipment. The adapter comprises a standard plug at one end and a socket at the other end, which is connected to the plug so as to reverse polarity at the socket.

3,626,355
ELECTRICAL CONNECTOR HAVING ADJUSTABLE-SIZE SOCKET OPENINGS AND REMOVABLE PLUGS
Jean C. Nudelmont, 130 Rue J. P. Timbaud, Courbevoie, France
Filed Apr. 14, 1969, Ser. No. 815,558
Claims priority, application France, Apr. 12, 1968, 148072
Int. Cl. H01r *11/22*
U.S. Cl. 339—14 R **5 Claims**



An electrical connector for accommodating plugs and sockets having different standard configurations. Some of the grounding plug pins are removable and may be inserted in any one of several socket holes as required. The socket holes are provided with spring-loaded bails to accommodate various diameter plug pins of either circular or rectangular cross section.

3,626,356
UNDERWATER CONNECTOR
Carey V. Trammell, Phoenix, Ariz., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Dec. 30, 1968, Ser. No. 787,920
Int. Cl. H01r *13/52*
U.S. Cl. 339—60 M **1 Claim**

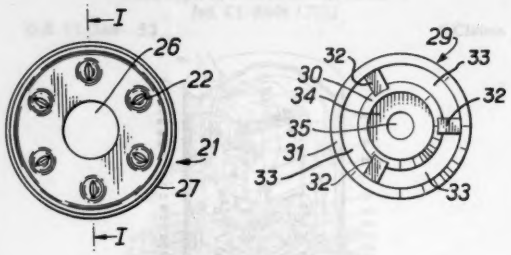


The disclosure relates to an underwater electrical connector comprising a plug connector and receptacle connector which are mechanically mated positively locking the connectors together. Inserts in each of the connectors contain contacting surfaces. The inserts are slidably engaged to provide a squeegee wiping action, forcing water out of the connectors through ports during the mating. The contacting surfaces are mounted flush with the surface of the inserts.

3,626,357
ELECTRICAL CONNECTING WASHER
Colin David Kindell, 22 Forest Walk, Bushey, Hertfordshire, and Terence Robert Raynor, 15 Russell Road, Chingford, London, E. 4, both of England
Filed Sept. 2, 1970, Ser. No. 69,086
Int. Cl. H01r *3/04*
U.S. Cl. 339—95 A **4 Claims**

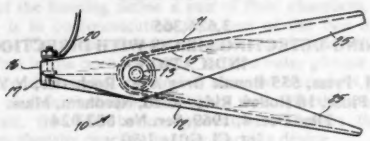
A connecting washer is provided with projections which scrape through a surface of a metal part to make an electrical

connection. Parts of a second resilient insulating washer are trapped between the connecting washer and the metal part



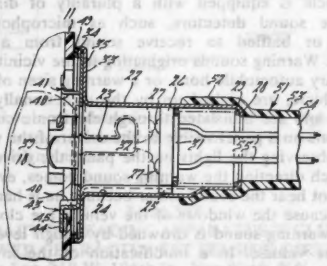
and around the projections to protect the connection area of the projections and the metal part from corrosive action.

3,626,358
FAST-CONTACT CLIP
William Klassen, 11260 Zion St. N.W., Coon Rapids, Minn.
Filed June 8, 1970, Ser. No. 44,073
Int. Cl. H01r *11/20*
U.S. Cl. 339—97 T **1 Claim**



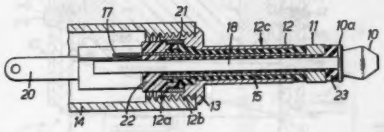
A clamping device for clipping against an electric wire so to connect two wires together, the device comprising a pair of levers which are connected pivotally free together along an intermediate portion of the levers, one end of the levers forming a squeeze handle and the opposite ends of the levers forming a pair of jaws, one of which has a seat across which a wire may be rested and the other jaw carrying a pointed stud for piercing the insulation around the seated electric wire and electrically engaging the enclosed electrical conductor.

3,626,359
LAMP SOCKET
Don L. De Lano, Mount Clements, Mich., assignor to Vare Corporation, New York, N.Y.
Continuation of application Ser. No. 748,858, July 30, 1968. This application June 17, 1970, Ser. No. 48,913
Int. Cl. H01r *9/16*
U.S. Cl. 339—127 **3 Claims**



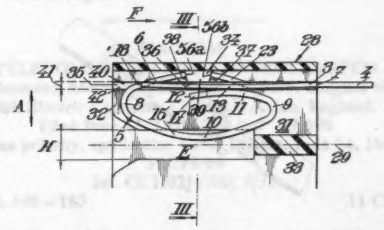
The socket is releasably supported at the rear face of a lamp housing with a socket sleeve containing bayonet recesses for orienting the filament of the lamp therein with the socket oriented on the housing and sealed thereto.

3,626,360
ELECTRICAL CONNECTORS
James Edward George Cole, Ansty, England, assignor to Rendar Instruments Limited
Filed Dec. 5, 1969, Ser. No. 882,458
Claims priority, application Great Britain, Dec. 9, 1968, 58,271/68
Int. Cl. H01r *17/18*
U.S. Cl. 339—183 **6 Claims**



A jack plug having at least three contacts of the tip, ring and sleeve type in which the separate conductors from the contacts are brought into a bush in the head of the plug which is formed to divide by lobes the space in the head into radially extending regions, a separate conductor being located in each region. This prevents the separate conductors making undesired electrical contact with each other.

3,626,361
CONNECTORS FOR INSERTABLE PRINTED CIRCUITS
Francois Robert Bonhomme, Saint-Cloud, France, assignor to Connectronics Corporation, New York, N.Y.
Filed Feb. 4, 1970, Ser. No. 8,595
Claims priority, application France, Feb. 4, 1969, 6,902,462
Int. Cl. H01r *9/08*
U.S. Cl. 339—217 S **9 Claims**

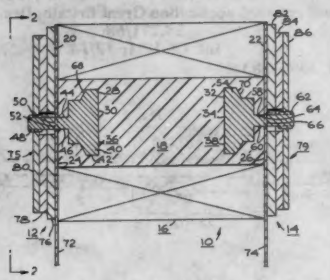


The connector comprises an insulating support housing an electrical contact member formed by a metallic strip having an intermediate portion whose opposite edges slide in grooves in the support. The intermediate portion has a longitudinal tongue which clamps the contact member in one direction and is contiguous on one side with a wiring tab and on the other with a curved portion for contacting the printed circuit. The housing has a boss for locking the contact member between tongues in the strip. The contact member can be introduced into the housing from either side.

3,626,362
TERMINAL AND CORE ARRANGEMENT
David Kellerman, 1485 S. Cardiff, Los Angeles, Calif.
Filed Nov. 17, 1969, Ser. No. 877,077
Int. Cl. H01r *9/16*
U.S. Cl. 339—218 C **10 Claims**

An improved terminal connection arrangement for an electrical component is provided in which a core means extends throughout the length of the electrical component and has terminal members at each end surface. The terminal members have an attachment portion. These may be male or female threads. Each of the male-threaded portions has a lead-receiving aperture therethrough. A wirelike lead means is inserted in each of the lead-receiving apertures and a deformable washer such as a lead or soft copper washer is placed over the threaded end portion of the terminal member and a rigid washer is placed adjacent the deformable washer.

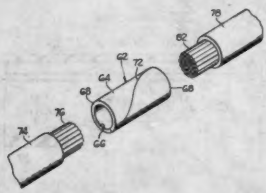
A nut threadingly engages the threaded portion and clamps the rigid washer against the deformable washer thereby deforming the deformable washer and pressing the lead means tightly against the end surface of the electrical component to make electrical contact therewith to provide circuit continuity through the component. No soldering, welding, dipping or spraying is required and therefore a heatless terminal connection is achieved. In the female-threaded embodiment, any desired threaded insert may be installed.



3,626,363
ROLL-FORMED CONTACT AND CRIMPING DEVICE THEREFOR

William McIver, West Monroe, La., and William R. Mattingley, Jr., Santa Ana, Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed July 29, 1969, Ser. No. 845,835
Int. Cl. H01r *5/08*
U.S. Cl. 339—276 R 6 Claims



A roll-formed contact having a terminal portion with a spiral seam therealong, such that the angular position of the seam around the terminal portion changes along the length of the terminal portion. Crimping indentors can be used to secure a wire conductor to the terminal portion and preferably are formed of a crimping end portion and a pair of positioning members fixed relative to each other and mounted on opposite sides of the end portion. The positioning members prevent the seam of the terminal member from splaying along the seam edge during the crimping process. In view of the spiral seam, orientation of the seam is not required with respect to the indentors.

ERRATA

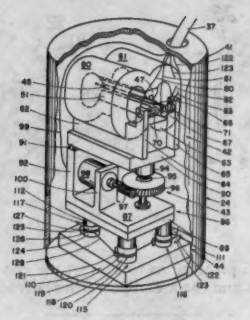
For Classes 340—170 and 340—172 see:
Patent Nos. 3,626,426 and 3,626,427

3,626,364
THREE-AXIS SEISMOMETER

Ivan Simon, Belmont; Carl R. Smallman, Lexington; Martin L. Cohen, Belmont, and Richard S. Stone, Lexington, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed July 15, 1969, Ser. No. 841,876
Int. Cl. G01v *1/16*
U.S. Cl. 340—17 19 Claims

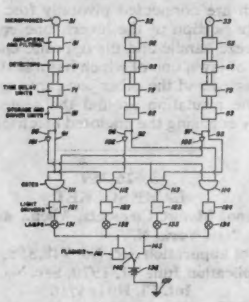
A three-axis seismometer in which three masses are suspended for essentially frictionless movement within certain directions in magnetic fields. Detecting means sense movement of the masses and generate signals used to actuate feedback means. The amount of feedback required is used as a measure of seismic motion. Since motion sensing and the measurement of the magnitude of the motion are separated, output of the instrument may be linear. Responses in unwanted frequency ranges may be filtered out.



3,626,365
WARNING-DETECTING MEANS WITH DIRECTIONAL INDICATION

Elliott H. Press, 555 Bonnie Brae Ave., Rochester, N.Y., and Hillel Pitlik, 18 Hollow Ridge Road, Needham, Mass.

Filed Dec. 4, 1969, Ser. No. 882,024
Int. Cl. G01s *3/80*
U.S. Cl. 340—34 10 Claims



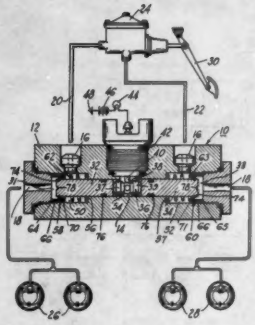
A vehicle is equipped with a plurality of directionally responsive sound detectors, such as microphones, each oriented or baffled to receive sound from a different direction. Warning sounds originating in the vicinity, such as an ordinary automobile horn, or a warning siren of an emergency vehicle, are picked up by the directionally sensitive receivers and are translated through electronic circuits into light signals on a panel visible to the driver of the vehicle, so that by observing the lights on the panel the driver can tell from which direction the warning sound comes, even though he may not hear the sound either because he is hard of hearing or because the windows of the vehicle are closed or the external warning sound is drowned by a high level of noise within the vehicle. In a modification of the invention, a receiver on the vehicle may be responsive to inaudible energy, such as radio waves, emitted by mechanism on an emergency vehicle such as an ambulance or a fire truck. The electronic circuits will light the visible panel to indicate that emergency signals are present.

3,626,366

SELF-LATCHING DIFFERENTIAL PRESSURE SWITCH

George M. Tam, St. Joseph, Mich., assignor to The Bendix Corporation

Filed Sept. 2, 1969, Ser. No. 854,675
Int. Cl. B60t 17/22
U.S. Cl. 340—52 5 Claims



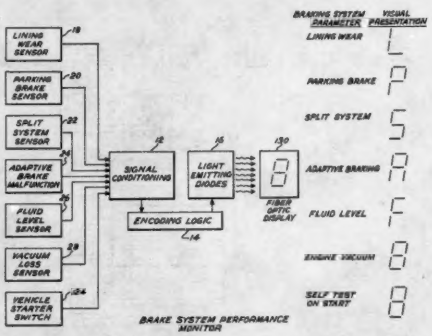
A switch responsive to differential pressure between first and second hydraulic brake systems three pistons arranged in end-abutting relationship in the bore of a housing. The outermost ends of the two outer pistons and the corresponding ends of the housing define a pair of fluid chambers, each of which is in communication with one of the two hydraulic systems. The inner piston actuates a warning device when it is shifted in the bore by one of the two outer pistons due to a pressure differential created in the two chambers resulting from a defective system. When the defective system is repaired, the first brake application recenters the three pistons, thereby deactivating the warning device.

3,626,367

VEHICLE SUBSYSTEM MONITORS

Donald W. Howard, and Dewey W. Eppley, both of South Bend, Ind., assignors to The Bendix Corporation

Filed Dec. 22, 1969, Ser. No. 887,016
Int. Cl. B60q 1/00
U.S. Cl. 340—52 F 4 Claims



A multiple error detection system utilizing light-emitting diodes to form a character representation in response to a given error signal input.

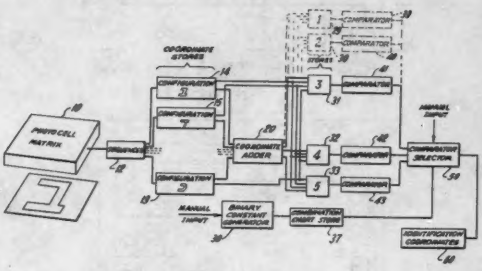
3,626,368

CHARACTER-READING APPARATUS INCLUDING IMPROVED CHARACTER SET SENSING STRUCTURE

Hsing Chu Lee, 219 W. 106th St., New York, N.Y.

Filed Jan. 13, 1969, Ser. No. 790,811
Int. Cl. G06k 9/12
U.S. Cl. 340—146.3 F 3 Claims

A reading machine, including devices to pick up the signals of group identification points for effectively differentiating configurations, is designed for use independently or in conjunction with a coordinate point selection apparatus. A coordinate matrix of photocells, the number and size of which are dependent upon the type of configurations to be analyzed scan each configuration recording for each the presence and absence of writing in the area viewed by each of the cells in a coordinate system. The number of "written" areas are then added numerically on a coordinate basis for all of the letter configurations. A combinatorial constant n, where 2^n equals



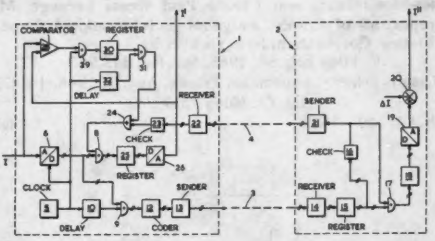
the total number of letter configurations, is derived and dictates the use of a specific stored combination chart. All those coordinate points have the totals 1 to $n-1$ (where n is the number of configurations) are separately stored and compared intra se to select those within each group which are unique. A selective choice is then made of predetermined groups to obtain a combination of unique subgroups equal to n. This is the group identification pattern or set of points unique to the particular number and type of configurations sought to be recognized.

3,626,369

TELECOMMUNICATION CONTROL SYSTEM

John Desmond Ainsworth, Stafford, England, assignor to The English Electric Company Limited, London, England

Filed June 23, 1970, Ser. No. 49,090
Claims priority, application Great Britain, June 24, 1969, 31,799/69
Int. Cl. H02j 1/00, 3/38
U.S. Cl. 340—163 11 Claims



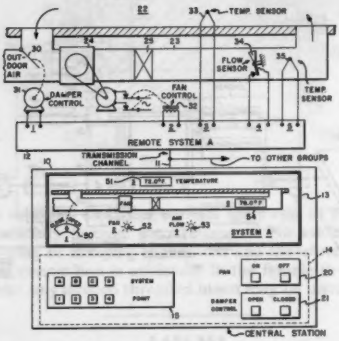
A control system for first and second converters in a high-voltage DC transmission link includes first and second control units which supply control signals I' and I'', respectively, to the converters. The first control unit receives a main control signal I and periodically generates a coded control signal which is transmitted via a link to the second control unit. If this coded signal is error-free, a check signal is transmitted back to the first control unit via a link and the signal I'' is updated. The signal I' is also updated if the check signal is received by the first control unit or if the main control signal is less than the signal I' when the first converter is operating as an inverter or greater than I' when the first converter is operating as a rectifier.

3,626,370

AIR-CONDITIONING CONTROL SYSTEM HAVING DISPLAY MEANS TO SHOW APPARATUS BEING SUPERVISED AND/OR CONTROLLED

Robert J. Stubbs, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 15, 1969, Ser. No. 866,460
Int. Cl. H04q 9/00
U.S. Cl. 340—163 2 Claims



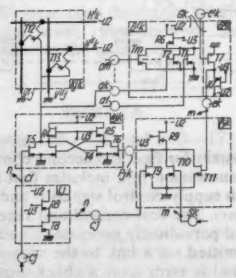
A system for remote temperature supervision and temperature control of a large and multispace, complex air-conditioning system wherein a central console is connected over a transmission circuit to a plurality of groups of remote apparatus. The console has a cathode ray tube for displaying a pictorial showing of a schematic layout of any one of the plurality of groups of apparatus. The cathode ray tube is selectively energized to obtain from a continuously updated memory one of a number of pictorial showings upon an operator at the central console associating the console and supervision apparatus of the console with one particular group of apparatus. The pictorial showing can be referred to for the identification of the particular apparatus to be supervised and/or controlled.

3,626,371

SCANNING CIRCUIT FOR ELECTRONIC MULTISELECTORS HAVING MOS TRANSISTOR MATRIX

Jacques Marcel Hennes, Paris; Marc Jean Pierre Leger, Issy-les-Moulineaux, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed July 30, 1969, Ser. No. 845,983
Claims priority, application France, Aug. 1, 1968, 161472
Int. Cl. H04g 1/00, 3/00
U.S. Cl. 340—166 7 Claims



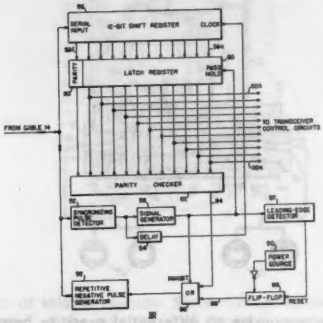
An electronic scanning circuit is provided using MOS integrated switches to set up electronic multiselectors. The electronic multiselectors are in the form of matrices of verticals and horizontals having MOS transistors forming the crosspoints.

3,626,372

DIGITAL INFORMATION TRANSMISSION SYSTEM

Kenneth A. Chayt, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 8, 1970, Ser. No. 26,550
Int. Cl. G08b 29/00; H04l 7/00
U.S. Cl. 340—168 R 10 Claims



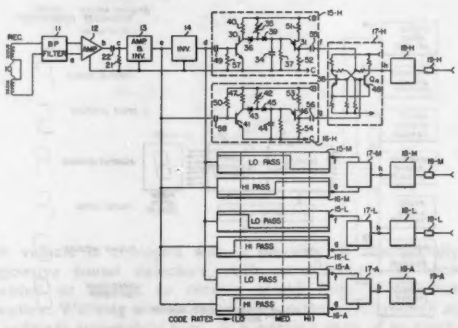
Transmission system whereby digital information in a shift register is serially transmitted into a remotely located shift register. The described preferred embodiment utilizes a hardwire link between a submarine and a towed buoy to control the operational mode of the buoy electronics and includes means which automatically reset the system in the event of a malfunction.

3,626,373

RATE CODE DECODING SYSTEM HAVING HIGH- AND LOW-PASS FILTERS

Clinton S. Wilcox, Rochester, N.Y., assignor to General Signal Corporation, Rochester, N.Y.

Filed Jan. 27, 1970, Ser. No. 6,185
Int. Cl. H04q 5/00
U.S. Cl. 340—171 10 Claims

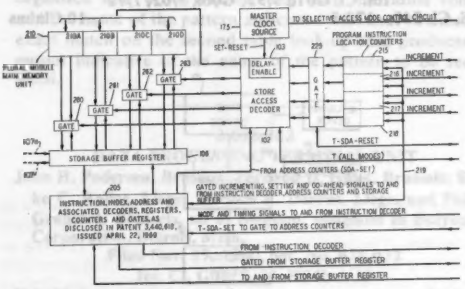


A decoding system has been provided for issuing a control signal in response to an input of one of a plurality of selected code rates. The improvement includes high-pass filtering means for each code rate responsive to the input and producing pulsed output energy when the input is at or exceeds the associated code rate and low-pass filtering means for each code rate responsive to the input and producing pulsed output energy when the input is at or below the associated code rate. Means for each code rate responsive to the associated high- and low-pass filtering means has been provided for producing the control signal when the associated high- and low-pass filters are both alternately producing pulsed outputs.

3,626,374
HIGH-SPEED DATA-DIRECTED INFORMATION PROCESSING SYSTEM CHARACTERIZED BY A PLURAL-MODULE BYTE-ORGANIZED MEMORY UNIT

Thomas Joseph Chinlund, New York, N.Y., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, Berkeley Heights, N.J.

Filed Feb. 10, 1970, Ser. No. 10,157
Int. Cl. G06f 13/00
U.S. Cl. 340—172.5 1 Claim

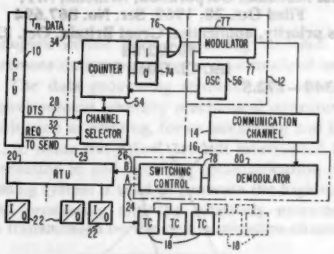

MASTER CLOCK SOURCE
TO SELECTIVE ACCESS MODE CONTROL CIRCUIT
PROGRAM INSTRUCTION LOCATION COUNTERS
DELAY-ENABLE
STORE ACCESS DECODER
INCREMENT
GATE
STORAGE BUFFER REGISTER
T-SDA-RESET
T-SDA-SET
FROM ADDRESS COUNTERS (SDA-SET)
INSTRUCTION, INDEX, ADDRESS AND ASSOCIATED DECODERS, REGISTERS, COUNTERS AND GATES AS DISCLOSED IN PATENT 3,440,610, ISSUED APRIL 22, 1969
MODE AND TIMING SIGNALS TO AND FROM INSTRUCTION DECODER
FROM INSTRUCTION DECODER
GATED FROM STORAGE BUFFER REGISTER
TO AND FROM STORAGE BUFFER REGISTER

A byte-organized variable-instruction-length system is modified in a unique fashion to implement the selective access mode of operation. As modified, the system includes a plural-module memory and a plurality of location counters respectively associated with the memory modules. In the selective access mode of operation each module location counter is altered by a different amount, in general, according to information stored in a bank of byte-organized selection registers. The various differently-locked bytes so referenced by the counters are then extracted from the memory to form a multibyte instruction, for data, word.

3,626,375
SWITCHING DATA SET

Leo B. Koziol, Livonia, and William P. Y. Mao, Plymouth, both of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Mar. 26, 1970, Ser. No. 22,761
Int. Cl. G06f 3/00
U.S. Cl. 340—172.5 8 Claims

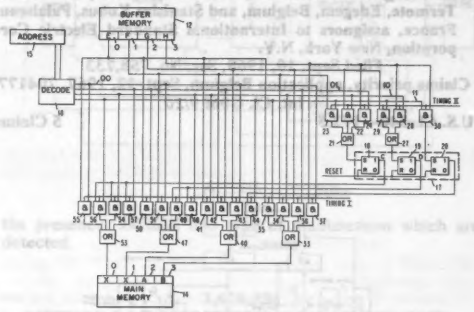


A switching data set to be utilized in an online data processing system having two different terminal units at the remote site. The switching data set is responsive to a special control signal indicating which terminal unit is to be connected on the line. The control signal is generated by a central processing unit and transmitted over the same data transmission lines as is the data information.

3,626,376
SKEWING CIRCUIT FOR MEMORY

Lawrence B. Anderson, Boulder, Colo.; Robert S. Capowski, Wappingers Falls; Gregg C. Hiatt, Poughkeepsie, and Joseph H. Miller, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1970, Ser. No. 37,070
Int. Cl. G06f 13/00
U.S. Cl. 340—172.5 4 Claims

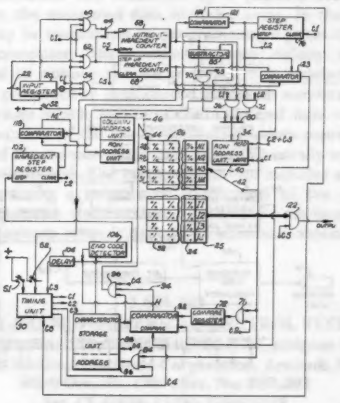


A circuit is provided for transferring a multibyte word of data from a buffer memory to a main memory beginning at any available byte position in the main memory. A gating circuit is controlled in response to an address designating the starting byte position for skewing bytes from the buffer to the starting byte position and to any remaining byte positions of the first addressed word location of the memory. A set of registers and a gating circuit are provided for storing any remaining data bytes from the word read from the buffer. On subsequent transfers, data is transferred simultaneously from the buffer and the register to form a complete word for storage in the main memory and remaining bytes from the buffer are then entered into the register for a subsequent transfer.

3,626,377
MATRIX GENERATOR FOR USE IN SOLVING FEED FORMULATION PROBLEMS

John B. Markley, Tucson, Ariz., assignor to Arizona Feeds

Filed Aug. 11, 1970, Ser. No. 62,929
Int. Cl. G06f 15/06, 15/36
U.S. Cl. 340—172.5 10 Claims



A system is disclosed for generating a matrix of data which relates to the formulation of animal feeds. The matrix is

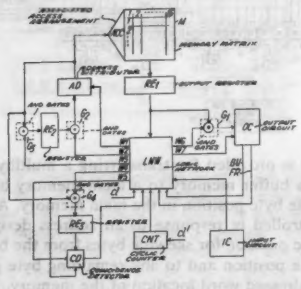
developed in a matrix register which is a logic array of component storage locations or registers for holding an organization of data relating to nutrients and ingredients. The specification of nutrients and ingredients for a desired feed is registered as two columns in the matrix register, from which the system operates to complete the entire matrix with information from an ingredient storage means which contains nutrient information on various specific ingredients.

3,626,378

ADDRESSING ARRANGEMENT

Adelin Eugene Gaston Salle, Versailles, France; Alois Rene Termote, Edegem, Belgium, and Stanislas Kobus, Palaiseau, France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Sept. 10, 1968, Ser. No. 758,733
Claims priority, application Belgium, Sept. 22, 1967, 704177
Int. Cl. G06f 9/20
U.S. Cl. 340—172.5 **5 Claims**



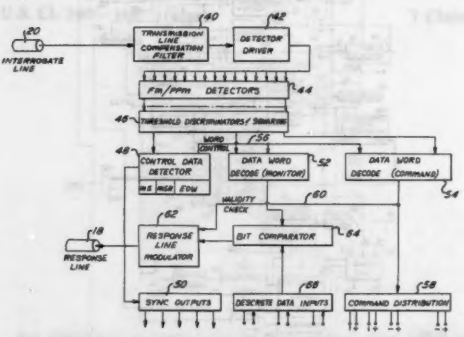
An addressing arrangement for accessing a memory storage location, and for accessing successive other locations if the first location returns a predetermined signal. A random number generator is used to provide the changes in the accessing location code. A specific application for which the arrangement is intended is to provide PBX hunting for an available line with a PBX group.

3,626,379

UNIVERSAL DATA ACQUISITION AND CONTROL SYSTEM

William R. Wrigley, 181 Claridge St., Satellite Beach, Fla.

Continuation of application Ser. No. 733,736, May 20, 1968. This application Jan. 18, 1971, Ser. No. 107,325
Int. Cl. G08b 11/00; G08c 15/00
U.S. Cl. 340—172.5 **5 Claims**



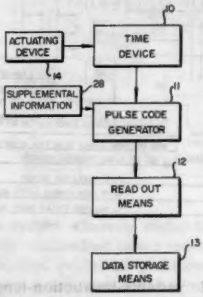
A universal data acquisition and control system using only two lines between a plurality of remote data units. The system uses a central computer connected to a central data unit. The central data unit is tied by two transmission lines (a response line and interrogate line) to a plurality of remote data units. The transmission of information on the interrogate line uses a combination of modulation schemes to maintain costs at a minimum while maximizing the amount in time that information can be transferred from the central data unit to the remote data unit.

3,626,380

SYSTEM FOR TIME RECORDATION

Gene E. Griffin, Silver Springs, Md., assignor to Systems Interface, Inc., Washington, D.C.

Filed Apr. 3, 1969, Ser. No. 813,121
Int. Cl. G01d 9/32; G06k 1/02, 1/12
U.S. Cl. 340—172.5 **10 Claims**



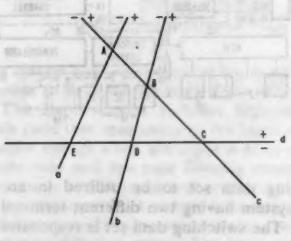
This disclosure provides a system for the recordation of time on a data storage means including a continuous record medium. The continuous record medium contemplates the use of punched paper tape, magnetic tape, or any other type of continuous record medium for effecting the entry of time and other information to provide a cost analysis for any type of business operation. The system of this invention includes a timekeeping mechanism interfaced with a pulse code generator and a collection information bank which includes the continuous record medium. The pulse code generator translates the time as produced by the timekeeping mechanism to a pulse train upon the energizing of actuating means included in the system. Additional apparatus is provided to prevent entries of two identical bits of information to be sensitively marked on a record card.

3,626,381

PATTERN RECOGNITION USING AN ASSOCIATIVE STORE

Alexandre Dubinsky, London, and Peter J. Titman, Winchester, both of England, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 20, 1969, Ser. No. 867,694
Claims priority, application Great Britain, Oct. 23, 1968, 50202/68
Int. Cl. G06k 9/10
U.S. Cl. 340—172.5 **13 Claims**



Graphical patterns, such as characters, are represented by sets of binary symmetric numbers (1, −1). An associative

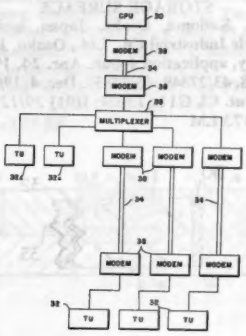
store holds a first table of numbers (1, 0, −1) organized into words representing the coefficients of hyperplanes for dividing a pattern space into volumes such that points in the same volume belong to the same pattern class. Each hyperplane representation is contained in a pair of words holding respectively the true and complemented forms of the hyperplane coefficients. A first associative table look-up determines which word of each pair more closely matches a particular pattern number set, by using the number set as a search argument. The resulting binary number string, indicative of a particular volume in the pattern space, is then used as a search argument for a second table in the store. The second table is organized into words representing each individual volume and the name of the pattern associated with that volume. An exact match on the second table look-up thus produces an output indicative of the name of the pattern to be recognized.

3,626,382

DATA PROCESSING TERMINAL UNIT

John H. Pedersen, Brussels; Fernand D. Gillet, Brussels; Slavko C. Radas, Liege; Jacques R. Debras, Liege, and Philipe Gransart, Brussels, all of Belgium, assignors to Burroughs Corporation, Detroit, Mich.

Filed Nov. 19, 1969, Ser. No. 878,072
Int. Cl. G06f *5/04*; H04b *1/38*
U.S. Cl. 340—172.5 **8 Claims**



A full duplex online data processing terminal unit for providing remote data processing for a centralized large scale computer. The data processing terminal unit operates in a real time environment whereby mechanical operation by the terminal unit such as printing, forms advancing and keyboard data input, to name but a few, are not interrupted by information processing to and from the communication channels. A single timing system is used to generate the high speed timing of data processing and the relatively extremely slow speed data transmission on the communication channels.

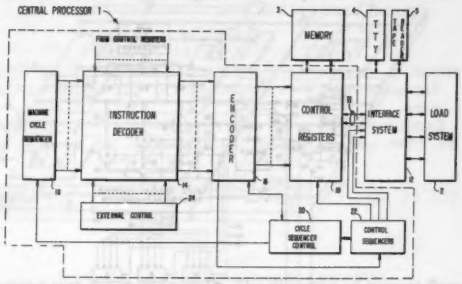
3,626,383

PROCESS FOR AUTOMATIC SYSTEM MAINTENANCE

William A. Oswald; Frank Y. Shaw, both of Rochester, and Lloyd H. Yost, Honeoye Falls, all of N.Y., assignors to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Nov. 26, 1969, Ser. No. 880,168
Int. Cl. G06f *11/04*
U.S. Cl. 340—172.5 **12 Claims**

Process for automatically testing the links and components of a multistage telephone switching network for determining the continuing proper operation thereof and for indicating the presence, location and type of malfunctions which are detected.

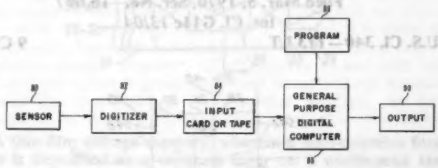


3,626,384

METHOD FOR REPRESENTING MEASURED DATA VALUES BY COEFFICIENT VALUES

Jonathan B. Davis, Mahopac, N.Y.; Nathen P. Edwards, Darien, Conn., and Harold H. Herd, Ossining, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1969, Ser. No. 887,703
Int. Cl. G01d *21/00*; G06f *7/00*
U.S. Cl. 340—172.5 **7 Claims**



A method is provided for reducing measured data to representative coefficient values. The data relates to physical energy collected and measured by a physical sensor, and therefore, the measured data includes noise. In the method which may be carried out by programming a general purpose digital computer, the measured data values are first processed to remove the linear trend. The resultant values are then processed to provide the maximum number of coefficient values which represent the measured data values. A certain number of the set of coefficient values represent the portion of the measurements which is substantially noise, and may be eliminated. The method therefore includes a process for determining a number of coefficients of the total set which represent the measured data with minimum error where minimum error is defined as minimum stochastic uncertainty.

3,626,385

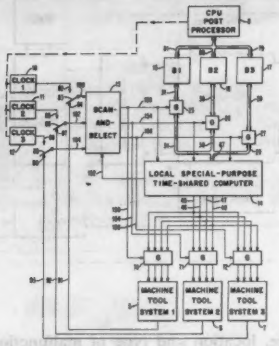
TIME-SHARED NUMERICAL CONTROL SYSTEM

Geert H. Bouman, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1969, Ser. No. 889,201
Int. Cl. G05b *15/00*; G06f *9/18*
U.S. Cl. 340—172.5 **8 Claims**

A data processing machine capable of providing numerical control of a plurality of numerically controlled multislide

machine tools or other motion machinery on a time-sharing basis operable in response to request signals associated with the machine tools from sources located either internally or externally of their control systems, on an interleaved basis. The machine completes one sequence instruction or a single



sequence of a multisequence instruction at a time for each machine tool controller, stops and seeks a request from the next tool controller in priority and then proceeds to service such next tool controller. Output data from the machine are directly connected to the inputs of the controllers from the logic of the machine without intervening buffering.

3,626,386

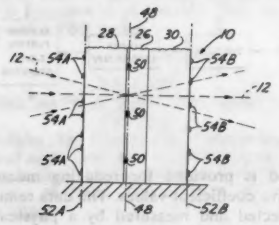
INFORMATION STORAGE SYSTEMS

Julius Feinleib, Birmingham, Mich., assignor to Energy Conversion Devices, Inc., Troy, Mich.

Filed Mar. 5, 1970, Ser. No. 16,697

Int. Cl. G11c *13/04*

U.S. Cl. 340—173 LT **9 Claims**



The information storage system disclosed herein employs an amorphous semiconductor thin film sandwiched between two transparent substrates. A beam of laser energy is focused on the thin film by a lens having a sufficiently short focal length compared to the thickness of the substrates so that dust particles on the outer surfaces of the substrates are in a plane which is essentially out of focus of the lens. Accordingly, these particles do not affect the storage and retrieval of data bits stored in the amorphous film as discrete spots of crystalline or more ordered structure.

3,626,387

FET STORAGE-THRESHOLD VOLTAGE CHANGED BY IRRADIATION

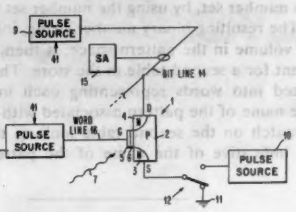
Louis M. Terman, South Salem, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 24, 1968, Ser. No. 789,429

Int. Cl. G11c *11/40*; H03k *17/60*

U.S. Cl. 340—173 LS **18 Claims**

An electron beam irradiated memory cell which stores information representative of both "ones" and "zeros" by the application of appropriate voltages during irradiation is disclosed. Depending on the potentials applied to the source, drain and gate electrodes of an insulated gate FET, the threshold of the device is either raised or lowered. In the raised condition, a signal cannot pass through the device, showing that a "zero" has been affirmatively stored in the IG FET. In the lowered condition, a signal can pass through the



device indicating that "one" has been affirmatively stored in the IG FET. The adjustment of the threshold is completely reversible. The method also includes the step of reading or detecting the condition of the IG FET by applying potentials to it in the absence of irradiation. Specific storage devices and apparatus for storing information in an array and a read-only memory are also disclosed.

3,626,388

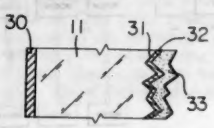
STORAGE DEVICE HAVING AN ALKALI-HALIDE STORAGE SURFACE

Yoshihiro Uno, Kadoma, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Claims priority, application Japan, Apr. 24, 1968, 43/2840 Apr. 25, 1968, 43/27849, 43/27851, Dec. 4, 1968, 43/89772

Int. Cl. G11c *13/04*; H01J *29/12*

U.S. Cl. 340—173 LM **6 Claims**



A storage device having a storage surface formed with an evaporated alkali-halide film which is divided into a plurality of minute sections that are disposed either on a single plane or on different planes. The storage surface provides increased cohesion with the backplate and freedom from build-up of electrical charge. The storage surface finds application to a storage device of either the light-transmitting or light-reflection type.

3,626,389

CROSS-POINT MATRIX MEMORY USING STORED CHARGE

Sigurd G. Waaben, Princeton, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

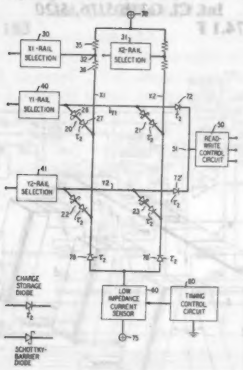
Filed Oct. 8, 1969, Ser. No. 864,705

Int. Cl. G11c *11/36*

U.S. Cl. 340—173 R **10 Claims**

A cross-point matrix memory including, in each cross-point circuit, a memory cell having a charge storage diode and a metal semiconductor diode in a series aiding circuit arrangement. An information bit is written into any selected memory cell by forward biasing both diodes of the selected cell thereby generating minority carrier charge in the charge storage diode. Thereafter the charge is stored in the cell by applying reverse bias to the two diodes for transferring the

charge to the junction capacitance of the metal semiconductor diode. The information bit stored in the selected cell is read out by applying a forward bias voltage ramp function to the cell.



3,626,390

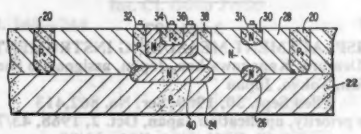
MINIMEMORY CELL WITH EPITAXIAL LAYER RESISTORS AND DIODE ISOLATION

Joseph J. Chang, Shelburne, Vt.; Irving Tze Ho, Poughkeepsie, N.Y.; Norbert G. Vogl, Jr., Essex, Vt., and Bevan P. F. Wu, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,416

Int. Cl. G11c *11/40*

U.S. Cl. 340—173 FF **6 Claims**



A nondestructive read-integrated circuit memory cell consisting of a pair of cross coupled transistors. The junctions between the collectors of the transistors and the intrinsic epitaxial layer is utilized to provide isolation between the transistors. The transistors are formed by a triple-diffusion process wherein the collector region contacts a buried layer of opposite semiconductivity relative to the semiconductivity of the substrate structure. An epitaxial growth being of the same semiconductivity as the buried layer region is utilized as both a resistive material between the input and the buried layer and to form a diode gradient between the epitaxial region and the collector region of the transistors. The buried region forms a diode junction with the collector regions of the transistor to allow a bilevel operation of the memory cell.

3,626,391

JOSEPHSON TUNNELING MEMORY ARRAY INCLUDING DRIVE DECODERS THEREFOR

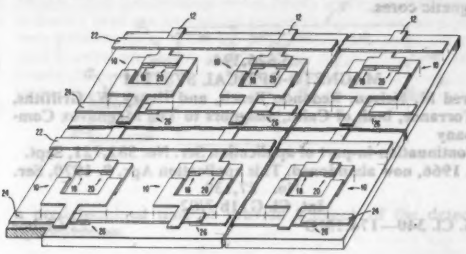
Wilhelm Anacker, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed July 15, 1968, Ser. No. 744,949

Int. Cl. G11c *11/44*; H03k *3/38*

U.S. Cl. 340—173.1 **14 Claims**

A memory array comprising memory cells having tunneling gates exhibiting Josephson current. Each memory cell is composed of two Josephson devices, each of which is located in a separate leg of the cell. Drive decoders using Josephson devices are also provided for selection of current into drive, bit, and sense lines (also having Josephson devices) associated with the memory cells. The direction of current flow in a memory cell determines its binary state.



3,626,392

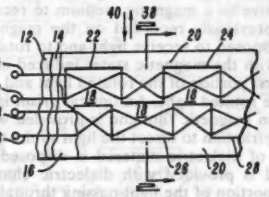
COMPOSITE THIN FILM MEMORY

Irving W. Wolf, and Andre A. Jaecklin, both of Palo Alto, Calif., assignors to Ampex Corporation, Redwood City, Calif.

Original application Nov. 16, 1965, Ser. No. 508,108, now Patent No. 3,626,392. Divided and this application Jan. 26, 1970, Ser. No. 3,969

Int. Cl. G11c *11/14*

U.S. Cl. 340—174 QA **5 Claims**



A thin film storage memory, wherein a high-coercive force film is deposited as a separate layer on a continuous low-coercive force film, in a selected pattern as determined by a masking coating of electrically nonconductive material. This provides a memory with storage provided in the low-coercive force film windows, bounded by the high-coercive force film.

3,626,393

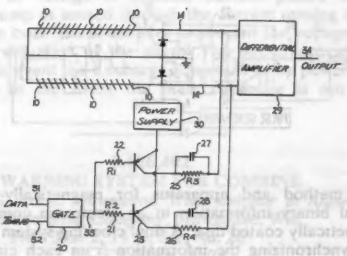
TEMPERATURE COMPENSATION CIRCUIT FOR MAGNETIC CORE MEMORIES

Henry M. Call, Orange, Calif., assignor to Documentor Sciences Corporation, Santa Ana, Calif.

Filed Feb. 13, 1970, Ser. No. 11,235

Int. Cl. G11c *5/02, 7/04, 11/06*

U.S. Cl. 340—174 SC **5 Claims**



An electrical circuit to compensate for the change in electrical characteristics of magnetic cores with changes in am-

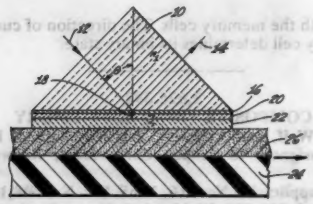
bient temperature. In a magnetic core memory system comprising a common inhibit and sense winding, the resistance of the inhibit-winding circuit used to compensate for increases in temperature and its effect upon the characteristics of the magnetic cores.

3,626,394

MAGNETO-OPTICAL SYSTEM

Alfred M. Nelson, Redondo Beach, and Henry W. Griffiths, Torrance, both of Calif., assignors to The Magnavox Company

Continuation-in-part of application Ser. No. 582,721, Sept. 28, 1966, now abandoned. This application Apr. 9, 1970, Ser. No. 27,130
Int. Cl. G11b 7/02
U.S. Cl. 340—174.1MO 22 Claims



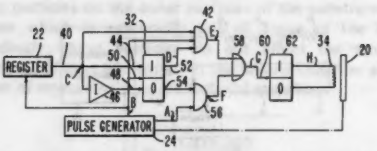
A magneto-optical transducer simultaneously utilizing both the Faraday and Kerr effects. The transducer includes a thin magnetic film having substantially a critical thickness and disposed relative to a magnetic medium to receive the magnetic states previously recorded on the magnetic medium. The film is disposed to receive light and to rotate the light in accordance with the magnetic states induced in the film and to reflect a first portion of the rotated light and pass a second portion of the rotated light. An optical prism is disposed adjacent the thin magnetic film and is provided with a particular index of refraction to direct the light to the thin film.
A first layer of dielectric material is disposed adjacent the thin film and is provided with dielectric characteristics to transmit the portion of the light passing through the thin film and to produce substantially an in-phase relationship between the reflected and transmitted portions of the light. A second layer of dielectric material is disposed adjacent the first layer of dielectric material and is provided with dielectric characteristics to produce substantially a total internal reflection of the transmitted light.

3,626,395

DUAL CLOCKING RECORDING AND REPRODUCING SYSTEM FOR MAGNETIC DATA

Virgilio J. Quiogue, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed May 6, 1970, Ser. No. 35,040
Int. Cl. G11b 5/02; G06k 7/00
U.S. Cl. 340—174.1 G 8 Claims



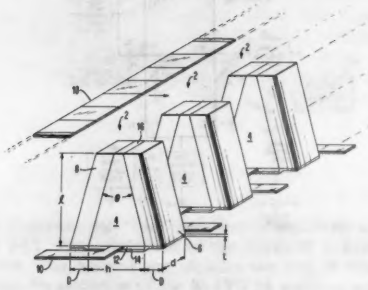
A method and apparatus for magnetically processing digital binary information in an electronic computer on a magnetically coated disc. A dual clocking system is provided for synchronizing the information from each circular track into the main clocking system of the computer. The method looks ahead to the next succeeding binary bit to determine the frequency of flux reversals on the disc.

3,626,396

THIN-FILM MAGNETIC RECORDING HEAD

Dean E. Eastman, Putnam Valley, N.Y., and George J. Fan, San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 3, 1968, Ser. No. 764,802
Int. Cl. G11b 5/16, 5/20
U.S. Cl. 340—174.1 F 12 Claims



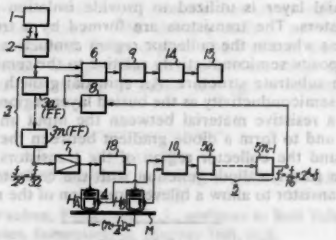
A magnetic recording head is composed of a substantially U-shaped member made of very thin, highly permeable, ferrite pole pieces. The front gap of the head is of the order of 0.1 mil in width and the magnetic path of the head is closed at the back sides of the pole pieces with a magnetic permalloy film having square loop or nonlinear switching characteristics. The use of the square loop film together with high-permeability pole pieces permits a small magnetic field from a tape or disc to switch a large amount of flux in the permalloy film. Such flux reversal can be sensed with a single turn film of metal.

3,626,397

DISPLACEMENT MEASURING INSTRUMENT

Saburo Uemura, Kanagawa-ken, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Sept. 30, 1969, Ser. No. 862,413
Claims priority, application Japan, Oct. 2, 1968, 43/71660
Int. Cl. G11b 5/04; G01r 33/00
U.S. Cl. 340—174.1 B 7 Claims



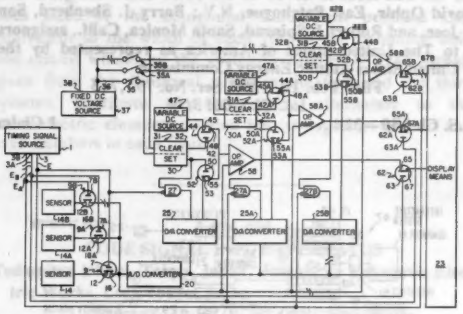
A displacement measuring instrument having means for producing a carrier signal, a transducer supplied with the carrier signal from the above means to phase modulate the carrier signal in accordance with a displacement, means for multiplying the phase-modulated signal, means for demodulating the multiplied, phase-modulated signal and means for counting the displacement with the demodulated signal.

3,626,398

MULTIPLE DISPLAY SYSTEM

Abner Owens, Jr., Paramus; Arthur Simon, Fair Lawn, and Kenneth J. Kendall, Fairfield, all of N.J., assignors to The Bendix Corporation

Filed Aug. 21, 1968, Ser. No. 754,423
Int. Cl. G08c 15/12
U.S. Cl. 340—183 4 Claims



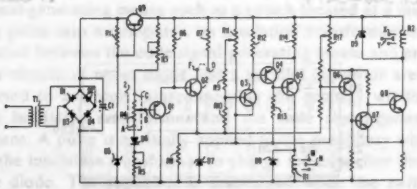
A multichannel electronic device providing data for displaying a plurality of actual flight conditions of an aircraft and for displaying the deviation of the actual flight conditions from the preset reference flight conditions or selected actual flight conditions, and multiplexing means for periodically displaying the data at a frequency to observe all conditions simultaneously.

3,626,399

INDICATOR AND CONTROLLER CIRCUIT FOR LIQUID LEVEL CONTROL

Lloyd T. Akeley, Fullerton, Calif., assignor to Simmonds Precision Products, Inc., Tarrytown, N.Y.

Continuation-in-part of application Ser. No. 715,863, Mar. 25, 1968, now abandoned. This application Oct. 16, 1969, Ser. No. 867,053
Int. Cl. G08b 21/00
U.S. Cl. 340—244 9 Claims



An indicator controller circuit for liquid containers having a liquid level responsive signaling device in which a two-stage amplifier having a unity voltage gain characteristic develops a current output from a transmitter voltage input. Connected to the output of the amplifier are two complementary Schmitt trigger circuits, one operating a high-alarm relay, the other operating a low-alarm relay for respective different levels of liquid sensed within the container.

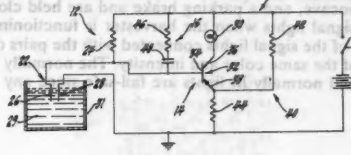
3,626,400

SELF-CHECKING FLUID LEVEL INDICATORS

Trevor Bates, Houghton Regis near Dunstable, England, assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 8, 1968, Ser. No. 765,905
Claims priority, application Great Britain, Oct. 18, 1967, 47,424/67
Int. Cl. G08b 21/00
U.S. Cl. 340—244 C 8 Claims

A fluid level detector comprising a probe circuit for the detection of fluid at a fluid level of interest, an indicator circuit for indicating the detection of fluid at the fluid level of interest, and a timer circuit operative upon initial energization of the detector so as to energize the indicator circuit for a predetermined time to provide a check of the detector operativeness.

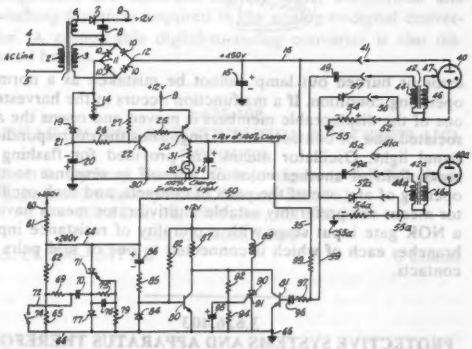


3,626,401

FAIL TO FLASH INDICATOR CIRCUIT

Robert A. Flieder, Englewood Cliffs, N.J., and Sumner S. Averett, Bayside, N.Y., assignors to Berkey Photo, Inc., New York, N.Y.

Filed Mar. 19, 1969, Ser. No. 808,583
Int. Cl. G08b 21/00
U.S. Cl. 340—253 11 Claims



A fail to flash alarm circuit including a main capacitor flash supply means and flash initiating means to discharge the capacitor into a discharge lamp. Control means includes alarm means so arranged as to be responsive to the actuation of the flash initiating means in the absence of current flow to the discharge lamp, this condition being determined by a current sensing resistor which is connected in the circuit to the discharge lamp to actuate switching means to block actuation of the alarm means. Bias means for the switching means may include a supervised charging circuit arranged so that bias means is not available to prevent a fail to flash alarm in the event the main capacitor is not fully charged. The bias means is connected through a voltage dropping resistor for normally dropping the control voltage to the second switching means. The drop in voltage is nullified current passed to the discharge lamp as sensed through the current sensing means and used to back bias the diodes to prevent the voltage drop and block actuation of the alarm. The circuit provides an alarm in the event the discharge lamp fails to be powered by current or in the event the main capacitor is not fully charged.

3,626,402

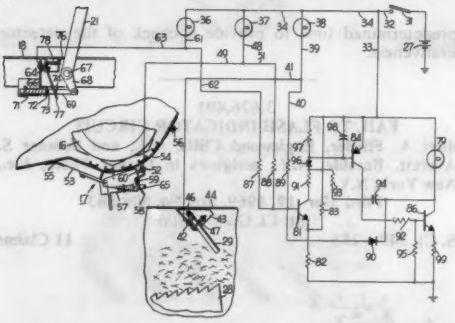
WARNING SYSTEM FOR COMBINE

Raymond G. Price, Milwaukee, Wis., assignor to Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Filed Jan. 2, 1970, Ser. No. 26
Int. Cl. G08b 19/00
U.S. Cl. 340—267 R 15 Claims

A fail-safe monitoring device for a self-propelled combine harvester has a plurality of signal lights mounted in the

operator's platform in the field of view of the operator and a plurality of pairs of electrical contacts each of which is connected in series with one of the signal lights across the battery of the harvester. The pairs of contacts are controlled by displaceable members of the harvester such as a straw walker door, a concave, and a parking brake and are held closed to light the signal lights when the harvester is functioning normally. All of the signal lights connected with the pairs of contacts are of the same color and intensity. The normally closed contacts and normally lit lights are fail-safe since any wiring



error or burned out lamp cannot be mistaken as a normal operating condition. If a malfunction occurs in the harvester, one of the displaceable members is moved and opens the associated pair of contacts and extinguishes the corresponding signal light. Oscillator means are provided for flashing a signal light of another color on and off in response to the opening of any one of the pairs of contacts, and such oscillator means are preferably astable multivibrator means having a NOR gate input stage with a plurality of resistance input branches each of which is connected to one of said pairs of contacts.

3,626,403

PROTECTIVE SYSTEMS AND APPARATUS THEREFOR

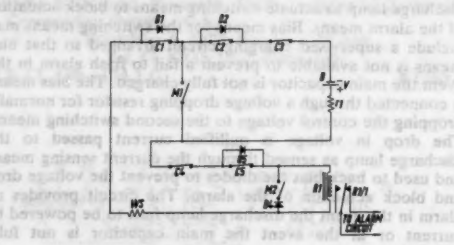
Goodwin A. G. Ive, Farm Cottage, High Road, Old Chipstead, In the County of Surrey, England

Filed Apr. 24, 1969, Ser. No. 818,860

Claims priority, application Great Britain, Apr. 29, 1968, 20,320/68

Int. Cl. G08b *13/08*

U.S. Cl. 340—276 **16 Claims**



A protective system capable of being monitored for day and night use comprising a single electrical loop including a plurality of series-connected contacts arranged to be actuated by an intruder and a relay connected in the loop and arranged to be rendered operative to actuate associated contacts connected in an alarm circuit to indicate the presence of the intruder, selected ones of the contacts having diodes connected across the contacts such that the system can operate in accordance with two different modes. For day use, the current flow through the diodes is such that no alarm indication is provided if a series-connected contact spanned by a diode is actuated, while for night use, a switching unit is provided to reverse the direction of current flow through the loop to cause the relay to be rendered operative if any series-connected contact is actuated.

3,626,404

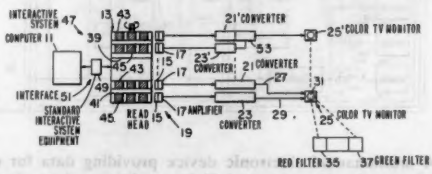
THREE-DIMENSIONAL DISPLAY SYSTEM

David Ophir, East Patchogue, N.Y.; Barry J. Shepherd, San Jose, and Robert J. Spinrad, Santa Monica, Calif., assignors to The United States of America as represented by the United States Atomic Energy Commission

Filed Feb. 10, 1969, Ser. No. 797,765

Int. Cl. G06f *3/14*

U.S. Cl. 340—324 A **1 Claim**



Interactive method and apparatus for producing three-dimensional television wherein means having a computer and stored program device feeds a standard television monitor with two separate signals to produce a stereographic display in different colors that can be viewed through separate colored filters for three-dimensional television viewing by a large number of people.

3,626,405

A D CONVERTER

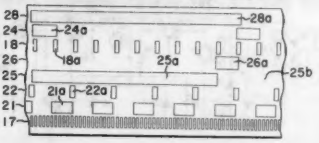
Takao Yamamoto, Fujisawa, Japan, assignor to Shinko Tsushin Kogyo Kabushikikaisha represented by Yasukazu Watanabe, Kanagawa-ken, Japan

Filed Jan. 30, 1970, Ser. No. 6,989

Claims priority, application Japan, Feb. 1, 1969, 44/7460

Int. Cl. G08c *9/00, 9/06*

U.S. Cl. 340—347 P **17 Claims**



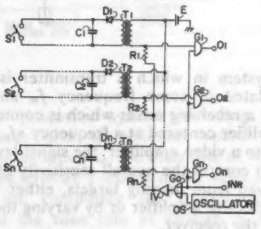
An analog digital converter comprising a first system for conversion of decimal numbers in all FIGS., in which an alternate ON-OFF signal is emitted from a photoelectric element whenever a divisional zone of minimum units having alternate transparent and opaque portions of uniform width shifts the minimum unit; a second system for indication of decimal numbers in each FIG., in which one among 10 photoelectric elements, but adjacent two at every converting borders, are exposed to passing light whenever divisional zones in which respective transparent portions each having a width equivalent to that of the minimum unit, 10^n, n means each FIG. where one place down from each pertinent FIG. and the same hereinafter, plus marginal width sufficient to cover at least one slit each on both sides of the transparent portions and are arranged centering in each phase corresponding to every 10^{n+1}th unit of the minimum units shift equivalent to the width of each 10^n of the minimum unit; a third system for advance of FIGS., in which alternate com-

pound ON-OFF signals are emitted from each pairs of photoelectric elements connected with ON side and OFF side respectively at the output of each photoelectric element for the highest number in each FIG. where one place down whenever each pairs of divisional zones consisting of alternately compound transparent and opaque portions each having a width equivalent to that of the minimum unit, 10", plus marginal width sufficient to cover at least one slit on both sides of the compound transparent portions shift equivalent to the width of each 10", of the minimum unit; and circuit which, by the switching of the ON-OFF signals given from the divisional zones in the first and the third systems, distribute electric current alternately to the photoelectric elements divided into two groups of odd and even numbers in each figure.

3,626,406
CODE SIGNAL INPUT APPARATUS

Tadamitsu Iritani, Tokyo, Japan, assignor to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Aug. 26, 1970, Ser. No. 67,031
Claims priority, application Japan, Sept. 26, 1969, 44/76783
Dec. 11, 1969, 44/99581
Int. Cl. H03k 17/56
U.S. Cl. 340—347 DD **3 Claims**



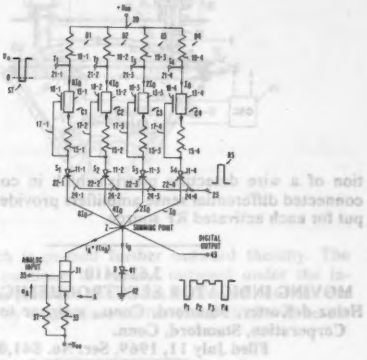
In apparatus to write a code signal generated by code signal-generating means such as a switch located at a measuring point into a computer, an insulation transformer is connected between the code signal-generating means and an output circuit. A series diode and a parallel capacitor are connected to a circuit interconnecting the primary winding of the insulation transformer and the code signal-generating means. A pulse is normally applied to the secondary winding of the insulation transformer to charge the capacitor through the diode. The capacitor is discharged when the switch is closed to decrease the secondary impedance of the transformer to produce an output signal corresponding to the code signal.

3,626,407
CIRCUITS FOR CONVERSION BETWEEN ANALOG AND DIGITAL REPRESENTATIONS OF DATA

Karsten E. Drangeid, Hedingen, and Andres Moser, Thalwil, both of Switzerland, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 27, 1970, Ser. No. 58,438
Claims priority, application Switzerland, Aug. 5, 1969, 11,852/69
Int. Cl. H03z 13/175
U.S. Cl. 340—347 AD **9 Claims**

An analog-to-digital converter is disclosed of the successive approximation type. The analog signal is converted to a current which is subtracted from the sum of weighted reference currents. Initially, all reference currents are switched on, but those not required for compensating the analog current are switched off in successive comparison steps. Illustratively, a thyristor-type switch is provided for each reference current source, and a common diode is provided as a path for the difference current. Through the novel combination of elements provided by this disclosure, these

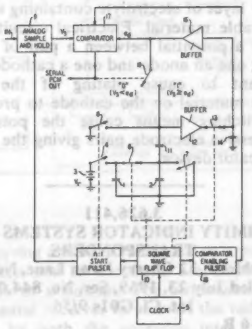


components are sufficient for the logic, comparison and switching functions required in the analog-to-digital conversion. A comparable digital-to-analog converter is also disclosed herein.

3,626,408
LINEAR CHARGE REDISTRIBUTION PCM CODER AND DECODER

Robert L. Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 31, 1969, Ser. No. 889,399
Int. Cl. H03k 13/02
U.S. Cl. 340—347 AD **6 Claims**



Circulating pulse code modulation (PCM) encoder and decoder which utilize capacitive charge redistribution techniques. A means for automatic scaling to adapt reference voltages to the signal to be converted is also provided.

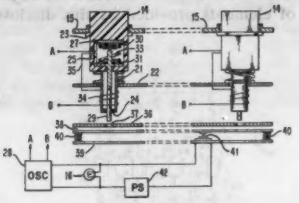
3,626,409
KEYBOARD DATA ENTRY DEVICE

Raymond Monroe Hill, and Leland Duane Lewis, both of Raleigh, N.C., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 13, 1970, Ser. No. 89,205
Int. Cl. G08c 1/00
U.S. Cl. 340—365 **8 Claims**

Each of the keys in a multiple key keyboard has associated with it a source of radiofrequency (RF) electromagnetic

energy which is activated when the key is depressed. The radiated energy from each key is directed to a unique location of a wire detecting matrix which in conjunction with connected differential sense amplifiers provides a unique output for each activated RF source.

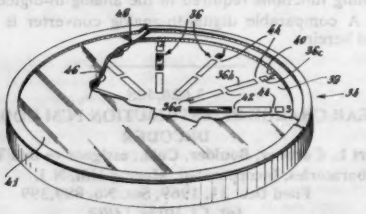


3,626,410

MOVING INDICATOR ELECTROCHEMICAL DISPLAY

Heinz deKoster, Stamford, Conn., assignor to General Time Corporation, Stamford, Conn.

Filed July 11, 1969, Ser. No. 841,055
Int. Cl. G04c 17/00; C23b 5/26
U.S. Cl. 340—373 **2 Claims**



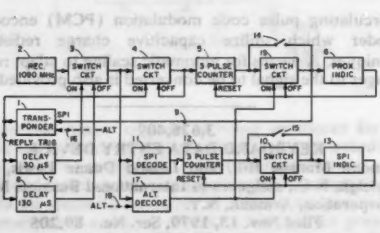
A moving indicator electrochemical display which may be used for a linear, or for a circular display device such as a clockface. A plurality of conductive electrodes are provided on an insulating substrate in a regular pattern and covered with a shallow layer of electrolyte containing ions of a visible electrodepositable material. Electrical circuitry is provided which applies a potential between a pair of adjacent electrodes making one an anode and one a cathode, the potential being sufficient to cause plating of the visible electrodepositable material on the cathode to produce a visible indicator. Switching means cause the potential to shift between successive electrode pairs giving the appearance of a moving indicator device.

3,626,411

PROXIMITY INDICATOR SYSTEMS USING TRANSPONDERS

George B. Litchford, 32 Cherry Lawn Lane, Northport, N.Y.

Filed July 23, 1969, Ser. No. 844,055
Int. Cl. G01s 9/56
U.S. Cl. 343—6 R **3 Claims**



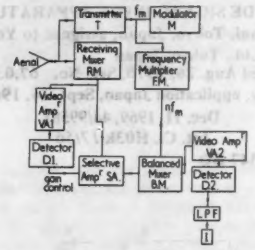
Mobile craft carrying radio repeaters or transponder beacons, which transmit in response to signals received from an initiating transmitter at a reference location, are arranged to receive also the responses from other similarly equipped craft. The time interval between reception of an initiating transmission and reception of the response from another craft affords an indication of the proximity of said other craft. The initiating transmitter may be a scanning device, such as a surveillance radar. Further resolution of the positional relationship between mobile craft can be provided by use of a plurality of differently located initiating transmitters.

3,626,412

RADAR SYSTEMS

Trevor Buckley, Malvern, England, assignor to Frowds Limited, Teddington, England

Filed June 18, 1969, Ser. No. 834,387
Claims priority, application Great Britain, Oct. 8, 1968, 47,629/68
Int. Cl. G01s 9/42
U.S. Cl. 343—7.7 **6 Claims**



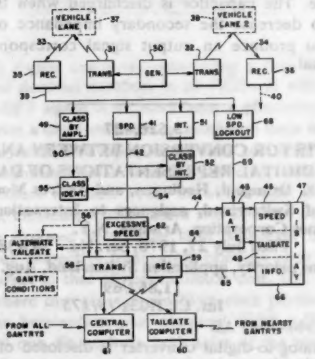
A radar system in which a transmitter is frequency or phase modulated at some frequency f_m and acts as the reference for a receiving mixer which is connected both to a selective amplifier centered at a frequency nf_m (where n is an integer) and to a video amplifier, the signal level in the latter being used to control the overall sensitivity of the system to signals received from moving targets, either by varying the gain of the selective amplifier or by varying the response of a later stage of the receiver.

3,626,413

TRAFFIC SURVEILLANCE AND CONTROL SYSTEM

Howard C. Zachmann, 2832 Montclair Drive, Ellicott City, Md.

Filed Feb. 2, 1970, Ser. No. 7,586
Int. Cl. G01s 9/44; G06f 15/48
U.S. Cl. 343—8 **20 Claims**



An all-weather system utilizing doppler radar devices for monitoring traffic on highways to provide warnings and

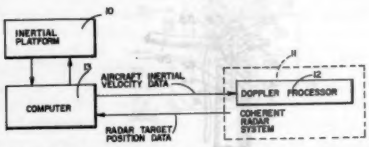
diversionary information to motorists. Radar equipment mounted on gantries at selected locations along the highways provides traffic information on the number, type and velocity of vehicles and together with complementary equipment such as a data-linked computer develops information on traffic density and required clear distance for trailing vehicles, continuously taking into account local environmental conditions. The latter "tailgate" information as well as velocity and diversionary information is provided at the gantries as a visual display. Counting of vehicles by class is performed both by doppler pulse amplitude and interval at a monitored speed techniques and two alternate configurations for providing the tailgate function are disclosed, one being completely self-contained at the gantry.

3,626,414

DOPPLER PROCESSING APPARATUS AND METHOD

Jacob E. Valstar, Orange, Calif., assignor to North American Rockwell Corporation

Filed Nov. 29, 1968, Ser. No. 779,943
Int. Cl. G01s *9/46*
U.S. Cl. 343—8 **7 Claims**



In a doppler processor system including an inertial guidance platform and a coherent radar having an azimuthally scanning antenna, the scan rate of which is substantially constant over all portions of the scan region, computing means for computing the on-boresight doppler velocity V_M and the time rate of change of the doppler velocity V_M whereby the use of function potentiometers mounted on the radar antenna gimbal system is avoided, and increased utilization is made of an onboard computer. Direction matrix conversion computing means, responsive to said radar and to said inertial platform, provides a first and second output corresponding to a respective one of a preselected derivative of the doppler velocity and the product $sE_{AN}V_{sRAD}$, where:

sE_{AN} = sine of the antenna elevation angle

V_{sRAD} = platform velocity resolved in the coordinates of the radar system.

A first analog integrator responsive to said first output of the computing means provides a signal indicative of V_M; and signal combining means having a first and second input, responsive to a respective one of said second output of the computing means and to the double integral with respect to time of the first output of the computing means, provides a signal indicative of V_M.

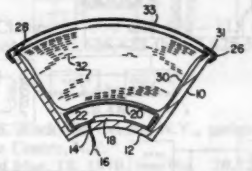
3,626,415

RADAR CHAFF EJECTOR

John A. Montgomery, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy

Filed Apr. 28, 1970, Ser. No. 32,684
Int. Cl. H01q *17/00*
U.S. Cl. 343—18 E **3 Claims**

A radar chaff ejector having a truncated segment shaped case containing in the bottom a gas-generating pyrotechnic covered by a gas cap. A flexible membrane fits into the case, covering the walls and the gas cap, and is secured to the rim of the case. Radar chaff is packed into the case and an arcuate cover is fitted thereon. When the device functions, the pyrotechnic ignites to generate gas pressure under the gas cap which accelerates the gas cap outward against the membrane to pop off the cover and effect an initial acceleration of the chaff. As the cap moves outward the gas pressure escapes around its edges but is contained by the flexible



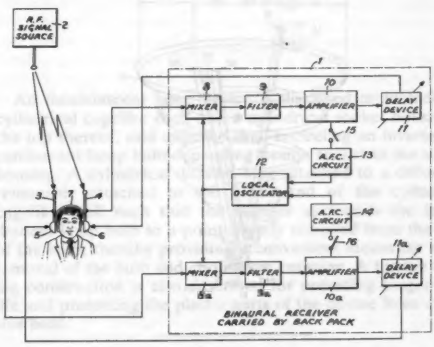
membrane which is pushed further outward thereby. The membrane will continue to expand outward under the influence of the gas pressure until it has ballooned out from the rim of the case, by which time all the radar chaff will be expelled.

3,626,416

DIRECTION FINDING RECEIVER

Gerald Rabow, Nutley, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Apr. 29, 1970, Ser. No. 32,952
Int. Cl. G01s *3/48*
U.S. Cl. 343—113 R **10 Claims**



An antenna having an omnidirectional or a predetermined directional pattern and an earphone are disposed adjacent each of the ears of a human. The antennas are interconnected by a binaural receiver to convert the radio frequency signal received by both the antennas into a pair of audiofrequency signals and preserve in the pair of audiofrequency signals the phase relationship between the received radio frequency signals. This will enable the human's sense of direction, as provided by the characteristics of the human ears, to locate the direction of the radiofrequency signal.

3,626,417

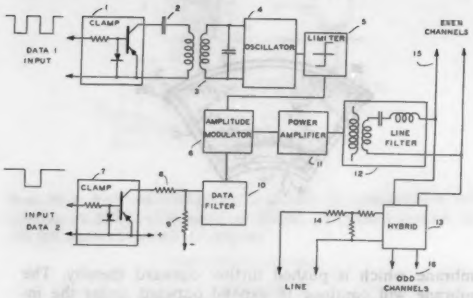
HYBRID FREQUENCY SHIFT-AMPLITUDE MODULATED TONE SYSTEM

Everett A. Gilbert, P.O. Box 1206, Montrose, Colo.

Filed Mar. 7, 1969, Ser. No. 805,294
Int. Cl. H04j *5/00*; **H04b** *1/00*
U.S. Cl. 343—203 **2 Claims**

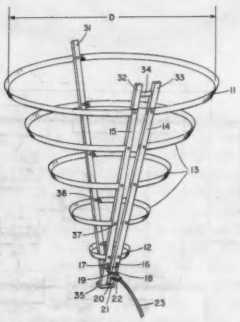
A two channel data transmission system using amplitude

modulation of the frequency shifted carrier of one channel to transmit the data of the second channel. Both channels



operate at the maximum data rate at which either a single AM or FS channel would operate over the same band width.

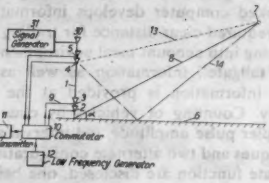
3,626,418
BROADBAND, OMNIDIRECTIONAL, HORIZONTALLY POLARIZED, LOOP ANTENNA
Walter Clayton Berryman, Jr., Westminster, Md., assignor to The Bendix Corporation
Filed Mar. 26, 1970, Ser. No. 22,946
Int. Cl. H01q *11/12*
U.S. Cl. 343—742 **3 Claims**



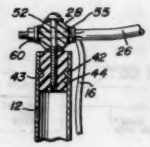
A broadband, horizontally polarized, omnidirectional antenna comprising a plurality of parallel-fed loop radiating elements is disclosed. This antenna has particular utility for reception of VHF entertainment broadcasts (Television channels 2–13 and the FM broadcast band).

3,626,419
DOPPLER NAVIGATION SYSTEM
Charles William Earp, London, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed Sept. 22, 1969, Ser. No. 859,915
Claims priority, application Great Britain, Sept. 23, 1968, 45,088/68
Int. Cl. G01s *1/38*
U.S. Cl. 343—106 D **6 Claims**

A first frequency signal is successively radiated from each antenna of a vertical array thereby simulating a constant velocity moving source; and second and third frequency signals are continuously transmitted from another antenna. A receiver responsive to all of the radiated signals derives therefrom the doppler shift of the first frequency signals which propagate to said receiver via a direct transmission path while distinguishing from those propagated via an indirect path. Said doppler shift is proportional to the angle of elevation from said receiver to said array.

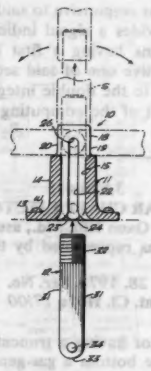


3,626,420
MAST-MOUNTED LOOP ANTENNA
Louis Kocsi, 25 Palisade Ave., Garfield, N.J., and Julius Kocsi, Jr., 102 Highland Ave., Clifton, N.J.
Filed Aug. 8, 1969, Ser. No. 848,494
Int. Cl. H01a *11/12*; H01q *11/12*
U.S. Cl. 343—742 **11 Claims**



An antenna assembly including separate antennas for receiving UHF and VHF signals disposed along spaced points on an antenna mast. The UHF antenna forms a closed configuration aligned in a plane at the top of the mast while the VHF antenna is characterized by two triangular members fastened to the mast in side-by-side relation aligned in a plane at an angle to the mast. Specially formed cylindrical insulative blocks, connected to the mast, furnish anchoring mounting support for the antennas.

3,626,421
MARINE ANTENNA-MOUNTING BASE
Manuel Santana, Miramar, and Frank Candela, Miami, both of Fla., assignors to Pearce-Simpson, Inc.
Filed Mar. 3, 1970, Ser. No. 16,047
Int. Cl. H01q *9/30*
U.S. Cl. 343—900 **8 Claims**



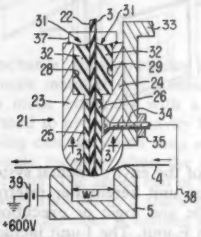
A two-part antenna support base for vertical "whip" antennas comprising a base member adapted to be secured to a

horizontal support surface and a support post slidingly receivable through the bottom of an upwardly extending sleeve portion integrally formed with the base member. The support post is movable between a lower position within the sleeve whereat it is constrained thereby in vertical disposition, and an upper limit position whereat it is swingable downwardly to each side through side openings at the upper end of the sleeve portion to permit downward swinging of the support post together with an antenna attached thereto at the upper end.

3,626,422
ELECTROGRAPHIC-WRITING HEAD HAVING A PREPONDERANCE OF CONDUCTIVE PORTIONS ENGAGING THE RECORDING MEDIUM

William A. Lloyd, San Jose, Calif., assignor to Varian Associates, Palo Alto, Calif.

Filed July 28, 1969, Ser. No. 845,358
Int. Cl. G03g *15/00*
U.S. Cl. 346—74 ES 6 Claims

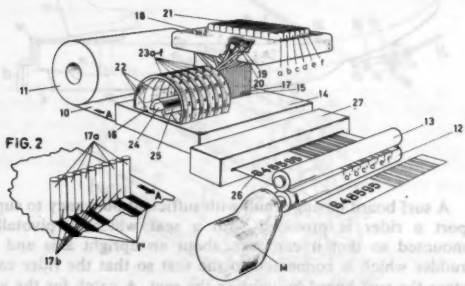


An electrographic-writing apparatus is disclosed having a writing head containing plural-writing electrodes and having portions bearing against the charge retentive surface of the recording medium. A backup electrode structure is spaced from the recording head to define a writing gap through which the recording medium is passed. A preponderance of the bearing surface of the recording head is formed by an electrode structure operated at a potential independent of the writing electrodes and at the potential of the backup electrode, to prevent depositing unwanted charges on the recording medium.

3,626,423
DEVICE FOR RECORDING INFORMATION ON A DATA RECORD

Tore Ameen, Solna, Sweden, assignor to Svenska Dataregister AB, Solna, Sweden

Filed June 4, 1969, Ser. No. 830,317
Int. Cl. G06k *15/12*
U.S. Cl. 346—107 R 4 Claims



A plurality of light-conducting rods are disposed with one end of each rod arranged in a parallel line in close proximity a continuous sheet of light-responsive recording medium. The other ends of the rods are disposed for coaction with light sources adapted to be energized, in coded combinations, upon actuation of the keys of a keyboard. The appearance of light at the end of the rods results in the recording of machine-readable longish lines on the light-responsive medium which is thereafter severed in labellike sections. A plurality of apertured wheels are also disposed in proximity to the light-responsive medium and for cooperation with a light source to facilitate the recording of visual figures on the medium.

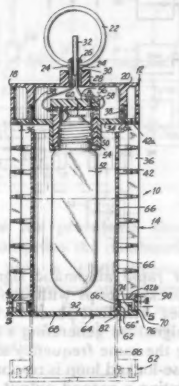
ERRATA

For Classes 9—310 and 408—115 see:
Patent Nos. 3,626,428 thru 3,626,513

3,626,424
LAMP

Robert D. Kahn, Rockville Centre, N.Y., assignor to Fedtro, Inc., Rockville Centre, N.Y.

Filed Mar. 18, 1970, Ser. No. 20,727
Int. Cl. F21v *29/00*
U.S. Cl. 240—47 2 Claims

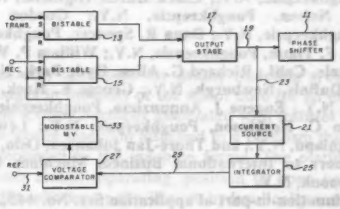


An incandescent lamp device is disclosed as including a cylindrical cagelike shell and a cylindrical socket housing at the top thereof, said cagelike shell encircling an inverted incandescent lamp bulb depending from a socket in the socket housing. A cylindrical diffuser base attached to a diffuser is removably attached to the lower end of the cylindrical cagelike shell such that the diffuser surrounds the incandescent lamp bulb to a point slightly removed from the base of the bulb, thereby providing a convenient means for ready removal of the bulb and cooling air emission. A further cooling construction is also described for providing longer bulb life and protecting the plastic parts of the device from excessive heat.

3,626,425
ELECTRONIC DRIVE CIRCUIT

Harry F. Strenglein, Clearwater, Fla., assignor to Sperry Rand Corporation

Filed Mar. 19, 1970, Ser. No. 20,964
Int. Cl. H03k *17/00*
U.S. Cl. 307—262 5 Claims



An electronic drive circuit for a microwave ferrite phase shifter includes a single output stage to drive the phase shifter to a specified level of magnetization of either polarity. Bistable circuits permit the output stage to magnetize the

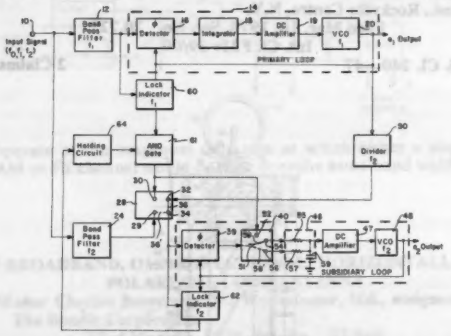
phase shifter in one polarity or the other in response to first or second command signals respectively. A signal indicative of the absolute value of the instantaneous voltage being applied to the phase shifter is integrated and compared to a reference voltage. When the integrated signal reaches a prescribed level, a monostable multivibrator is actuated and the magnetization current to the phase shifter is terminated.

3,626,426

PHASED LOCKED LOOPS

Richard Steinberg, Encino, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed Jan. 29, 1970, Ser. No. 6,698
Int. Cl. H03h *7/20*
U.S. Cl. 340—170 **7 Claims**



Apparatus for rapid automatic signal acquisition having multiple phase-locked loops with coherently related output signal frequencies. The first phase-locked loop is responsive to a first input signal for generating a first output signal having substantially the same frequency as the first input signal. The second phase-locked loop is responsive to a second input signal for generating a second output signal having substantially the same frequency as the second input signal. A signal generator provides a phase-lock signal to phase-lock the second loop. Another signal generator generates a signal which indicates phase-lock of both the first and second loops. An integrator having short and long time constant circuit portions is provided in the second loop such that upon being suitably switched it provides either a fast or slow signal response to the second loop. A switch mechanism normally applies the phase-lock signal to the second loop, and switches the integrator so as to provide the second loop with the short time constant circuit portion and accordingly a fast signal response until the second loop becomes phase locked. The switch mechanism then applies the second input signal to the second loop, and so switches the integrator in the second loop as to provide it with the long time constant circuit portion and slow signal response when the phase-lock indicating signal indicates that both loops are phase locked.

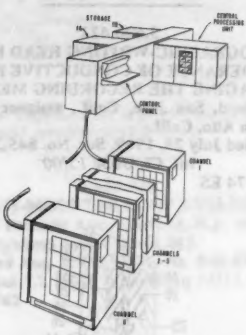
3,626,427

LARGE-SCALE DATA PROCESSING SYSTEM

Olin L. MacSorley, Lake Katrine, N.Y.; Leo J. Hasbrouck, Poughkeepsie, N.Y.; Wesley C. Stetler, Poughkeepsie, N.Y.; C. Richard Holleran, Saratoga, Calif.; Alan R. Geller, Poughkeepsie, N.Y.; Clark Kurtz, Highland, N.Y.; Robert A. Nelson, Poughkeepsie, N.Y.; Gordon L. Smith, Poughkeepsie, N.Y.; Dana R. Spencer, Poughkeepsie, N.Y.; Joe F. Timm, Poughkeepsie, N.Y.; William P. Wissick, Sunnyvale, Calif.; Richard G. Allen, Hyde Park, N.Y.; Thomas F. DuBois, Newburgh, N.Y.; George E. Hack, Poughkeepsie, N.Y.; Eugene J. Annunziata, Poughkeepsie, N.Y.; William C. Hoskinson, Poughkeepsie, N.Y.; Lewis E. King, Highland, N.Y., and Thore-Jan Johansen, Oslo, Norway, assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of application Ser. No. 445,326, Apr. 5, 1965, now abandoned. This application Jan. 13, 1967, Ser. No. 609,238
Int. Cl. G06f *9/00, 15/00, 3/00*
U.S. Cl. 340—172.5 **62 Claims**

The specification discloses an illustrative embodiment for the invention comprising a large-scale data processing system of the type which is composed of a plurality of quasi-independent units. The environmental data processing system includes a central processing unit or portion, which is herein referred to as a CPU, a plurality of storage units, a plurality of input/output control devices referred to herein as channels, as well as control and maintenance facilities which are found in a power distribution unit, herein referred to as a



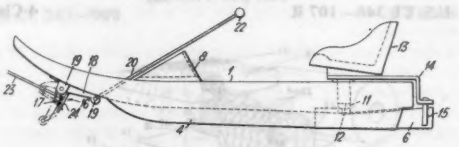
PDU. The CPU of the environmental system includes a control or instruction unit hereinafter referred to as an I-unit, and an arithmetic and logic or execution unit, hereinafter referred to as an E-unit. The I-unit includes controls for instruction fetching, branching, interruption handling, communication with the input/output channels, and other related functions. The E-unit of the environmental system can perform algebraic and logical operations, moving, shifting, and other functions.

3,626,428

SURF BOARDS

Christopher Collaro, 25-27 Effra Road, London, S. W. 2, England

Filed Dec. 3, 1969, Ser. No. 881,721
Claims priority, application Great Britain, Feb. 4, 1969, 5,982/69
Int. Cl. A63c *15/00*
U.S. Cl. 9—310 E **13 Claims**



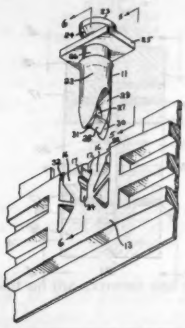
A surf board having a hull with sufficient buoyancy to support a rider is provided with a seat which is pivotally mounted so that it can turn about an upright axis and a rudder which is connected to the seat so that the rider can steer the surf board by twisting the seat. A catch for the attachment of a towrope to the hull is provided on the underside of the bow of the hull and the catch has a release mechanism controlled by a member which extends towards the seat to enable it to be held by the rider. The release mechanism is so arranged that when the control member is held and pulled by the rider, the catch holds the towrope, but on release of the control member, the release mechanism causes the catch to release the rope.

3,626,429

DETACHABLE DRAPERY CARRIER

Ellis I. Toder, 9225 Grace Lane, Philadelphia, Pa.

Filed Oct. 29, 1969, Ser. No. 872,085
Int. Cl. A47h *13/00*
U.S. Cl. 16—87.2 4 Claims



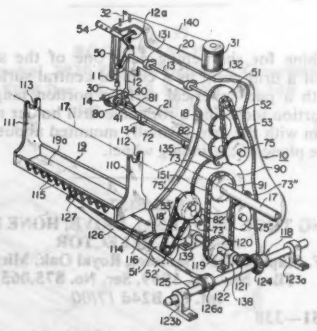
A two part detachable drapery carrier and heading stiffener including a male member and a female member. The female member is made integrally with a drapery-heading stiffener and is formed to provide a cavity between movable latch elements having catches which snap over and lock the lower end of the male member when the latter is properly located within the cavity. The upper end of the male member is formed to be easily slidable in a track system, while the lower end of the male member is formed to cam open the latch elements of the female member. In addition the lower end of the male member has a double inclined surface over which the catches of the latch elements fit to couple the male member with the female member. The trunk of the male member is formed to enable the device to be rocked or moved in the plane of the drapery-heading stiffener without unlatching the male member from the female member, while at the same time it is formed to permit unlatching of the male member from the female member in response to relative movement therebetween in a plane which is substantially perpendicular to the plane of the drapery-heading stiffener.

3,626,430

METHOD AND APPARATUS FOR LACING A HANK

Takashi Ohta; Yoshinobu Adachi; Shygeru Tanaka, and Toshiaki Norimatsu, all of Nobeoka-shi, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Jan. 5, 1970, Ser. No. 723
Claims priority, application Japan, Jan. 3, 1967, 44/2
Int. Cl. B65h *55/00, 69/04*
U.S. Cl. 28—21 5 Claims



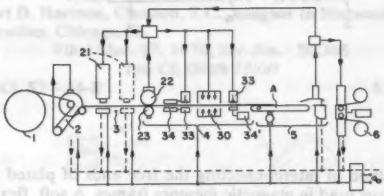
A process for lacing a hank using a reciprocating needle threaded with an upper thread and a rotary looper feeding a lower thread therefrom, said process being characterized in that said both threads form in combination a plurality of half hitches at each end of the lacing for the formation of a knot and a series of regular lock stitches between said end knots.

3,626,431

AUTOMATIC MACHINE FOR PROCESSING CONNECTING WIRES

Michel Thierri, and Pierre Toussaint, both of Amiens, Somme, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 16, 1969, Ser. No. 885,606
Claims priority, application France, Dec. 20, 1968, 179506
Int. Cl. H01r *43/04*
U.S. Cl. 29—203 D 1 Claim



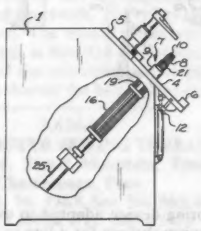
Automatic machine for processing electric connecting wires. The machine comprises the combination of a winding off unit, a marking unit, a length-measuring member, a stripping member, a transmission and feeding unit and a terminal-sleeve insertion unit. Pneumatic means control the cycle of the various units at a high rate and safety members provide a reliable operation.

3,626,432

TILT TOP TOOLING PLATE FOR COIL ASSEMBLY MACHINES

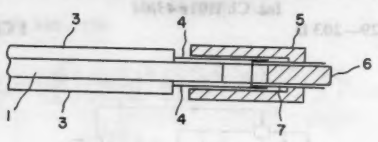
Henry B. Fohl, Wellston, and Frank Korski, Brentwood, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 29, 1969, Ser. No. 888,525
Int. Cl. H02k *15/06*
U.S. Cl. 29—205 12 Claims



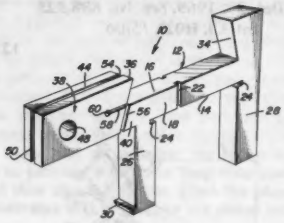
A coil assembly apparatus for axially inserting prewound coils and wedges in the slots of the stator core for an electric motor has the tooling normally associated with transfer winding and bore wedge insertion attached to a platform that is in turn hinge mounted to the machine frame. The platform is moveable from closed, operating, position to open position by a hydraulic cylinder or the like. A hydraulically activated ram transmits power to the tooling through a separable connector. In the open, raised position of the platform, the tooling attached to the underside of the hinged platform is disconnected from the ram, accessible to operator or maintenance personnel, and readily manipulatable.

3,626,433
METHOD FOR INTERCONNECTING PLATED WIRES USED IN MAGNETIC MEMORY FRAMES
Arthur P. Schultz, Woodstock, N.Y., assignor to Ferroxcube Corporation, Saugerties, N.Y.
Filed Feb. 10, 1969, Ser. No. 797,946
Int. Cl. H01f 7/06
U.S. Cl. 29—604 **4 Claims**



A method of interconnecting the free ends of plated wire conductors used in magnetic memory frames. A soft, flexible, interconnecting ribbon conductor is shaped to a configuration which will permit its freedom of movement, and is attached to the free ends of each of two plated wire conductors positioned on opposite sides of the frame. The resultant connection will be "free floating" and stress free.

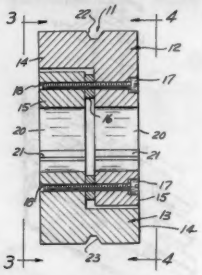
3,626,434
LINE DOG
Bruce L. Miller, Bowling Green, Ky., assignor to Lera M. Jones, Bowling Green, Ky.
Filed Feb. 13, 1970, Ser. No. 11,088
Int. Cl. B44d 3/00
U.S. Cl. 33—86 **8 Claims**



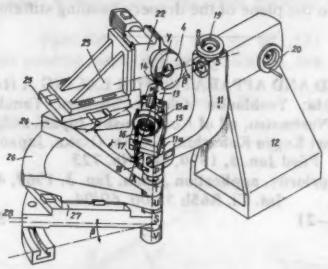
A line-anchoring device adapted to establish an anchoring point on a masonry surface for a line to guide laying of brick and/or blocks. A pair of legs extend from the elongated body of the anchoring device spaced from an externally grooved head presenting an angled edge in confronting relation to a tail projecting from the body in a direction opposite to one of the legs.

3,626,435
DRESSING ROLL
Frank P. Tuczak, Livonia, Mich., assignor to Sidley Diamond Tool Co., Detroit, Mich.
Filed Sept. 11, 1970, Ser. No. 71,521
Int. Cl. B24d 17/00
U.S. Cl. 51—206.5 **4 Claims**

A dressing roll formed of a ring-shaped rim diametrically cut into two axially and radially aligned semicircular halves, with a continuous abrasive-coated dressing groove formed in the peripheral edge of said rim. Each rim half is provided with a ring-shaped end plate integral with its inner surface at one end thereof, with the plates being less than one-half the axial thickness of the rim. The plates are arranged face to face, encircled by and arranged within the rim, and are fastened together by adjustable mechanical fasteners for axially shifting and then fixing the two rim halves relative to each other for thereby axially offsetting the two halves of the groove formed in the rim halves.



3,626,436
MACHINE FOR SHARPENING TWIST DRILLS
Francois Lhomme, and Bernard Leguy, both of Billancourt, France, assignors to Regie Nationale des Usines Renault, Billancourt, France
Original application June 15, 1967, Ser. No. 646,254, now Patent No. 3,535,831, dated Oct. 27, 1970. Divided and this application Sept. 3, 1969, Ser. No. 854,904
Claims priority, application France, July 19, 1966, 69898
Int. Cl. B24b 3/30
U.S. Cl. 51—124 **3 Claims**

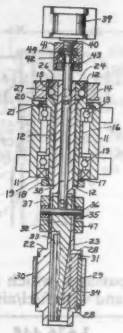


A machine for sharpening each one of the symmetrical portions of a drill point as a conical central surface portion edged with a part-spherical surface portion tangent to the central portion including a rotatable drill holder mounted on a bent arm with the arm pivotally mounted about an oblique axis to the plane of a grinding wheel.

3,626,437
HONING TOOL UNIVERSAL DRIVE, HONE HOLDER AND SIZE SELECTOR
Charles F. Staples, 4456 Samoset, Royal Oak, Mich.
Filed Nov. 10, 1969, Ser. No. 875,065
Int. Cl. B24d 17/00
U.S. Cl. 51—338 **1 Claim**

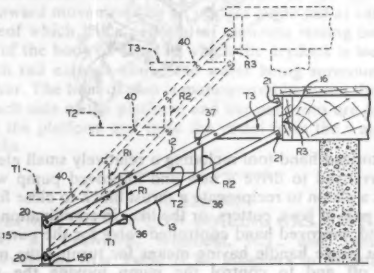
A honing tool having a body provided with radial slots for the reception of a plurality of hone holders that are a sliding fit in the slots, metal-bonded abrasive hones mounted onto the outer faces of the holders, the inner faces of the holders are provided with channels for the reception of expansion plates, an expansion wedge slidably fitting an aperture in the

body, a stop collar cross-pinned to the wedge, adjustable stop nuts for locating the stop collar longitudinally of the body



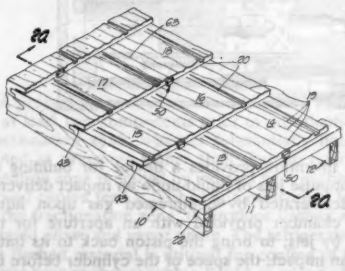
and a universal joint on the extreme end of a shaft for driving the body.

3,626,438
ADJUSTABLE STAIRS
George L. Cornell, Harrison, Ark., assignor to Ozark Metal Products, Inc., Harrison, Ark.
Filed Dec. 15, 1969, Ser. No. 885,115
Int. Cl. E04f *11/06*
U.S. Cl. 52—183 2 Claims



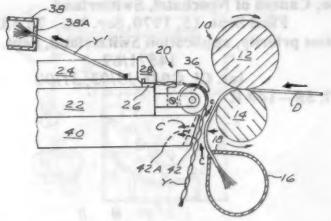
Adjustable stairs are presented by side supports each including a pair of longitudinal stringers and a pair of end links transverse thereto, the four being pivotally joined as a parallelogram. The stair tread and riser span the supports and are pivotally connected thereto, preferably at the angle where the tread and riser meet. The stairs can therefore be manipulated as a flexible assembly to meet the pitch angle required, whereafter the side of the tread is fastened to the stringers to produce a fixed relationship.

3,626,439
ROOF PLANKING
Joseph P. Kneisel, 3920 El Lado Drive, La Crescenta, Calif.
Filed Dec. 15, 1969, Ser. No. 885,148
Int. Cl. E04d *1/36*
U.S. Cl. 52—533 10 Claims



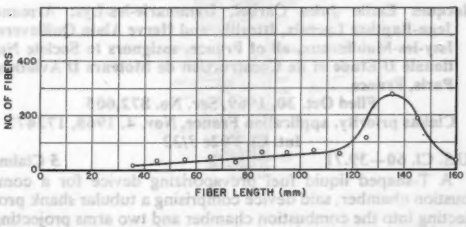
There is disclosed herein a new roof construction wherein the roofing material is in the form of planks and may be secured directly to rafters, eliminating the need for sheathing and a moisture barrier or membrane such as felt sheeting. The planking has a particular lock joint arrangement which, along with joint drain clips, provides a watertight construction. The exposed surfaces of the planks may be textured to simulate shakes, shingles, tiles or any other texture or pattern desired, and the planks may be of laminated construction, such as of plywood. Not only is the construction watertight, but it is particularly structurally sound and with no exposed fasteners, such as nails and the like. The planks may be readily mass produced and then shipped to the site for installation. A fireproof coating and coloring may be applied to the planks during manufacture thereof.

3,626,440
YARN-PIECING APPARATUS AND METHOD WITH YARN COLLATION BY VACUUM
Albert D. Harmon, Clemson, S.C., assignor to Maremont Corporation, Chicago, Ill.
Filed Mar. 17, 1970, Ser. No. 20,365
Int. Cl. D01h *15/00*
U.S. Cl. 57—34-R 8 Claims



A yarn-collating vacuum means and method are disclosed for use in association with a yarn-piecing apparatus having a freely rotatable roller as the yarn-proffering element thereof, to assure the consistent and strong joining of diverse yarn-ends despite offset of their threadlines prior to the piecing operation. The vacuum means has a mouth opening positioned below and close to the roller so as to be in line with the yarn-end entrained on the roller and depending therefrom. In operation, as the roller bearing the entrained end approaches another yarn-end to be pieced therewith, the vacuum means, in a yarn-collating action, draws in air currents and with them draws the other end into engagement with the entrained end. The entrained end at this time is clamped and twisted to hold it in a spaced away relation to the vacuum means mouth and to impart to it an overtwist. It is then released to untwist and in so doing intertwines with the other end collated therewith. The roller then is rotated to unentrain the first end. The mouth of the vacuum means, in preferred embodiments, is bevelled and/or has grooves in line with the threadline of the entrained end to permit close, yet spaced away relation thereto for better yarn collation.

3,626,441
POLYESTER SEWING THREAD
Walter Wayne Freed, Signal Mountain, Tenn., assignor to Dixie Yarns, Inc., Chattanooga, Tenn.
Filed Oct. 10, 1969, Ser. No. 865,403
Int. Cl. D01h *1/12*; D01g *1/08*
U.S. Cl. 57—140 R 8 Claims



This specification discloses a sewing thread spun from sta-

ble lengths of polyester fiber produced by repeated breaking under tension.

3,626,442

BICOMPONENT POLYESTER TEXTILE FILAMENT

Edward A. Haseley, Grifton, and Elmer E. Most, Jr., Kinston, both of N.C., assignors to E.I. du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 26, 1969, Ser. No. 853,192
Int. Cl. D02g *1/18, 3/04, 3/24*
U.S. Cl. 57—140 BY 4 Claims

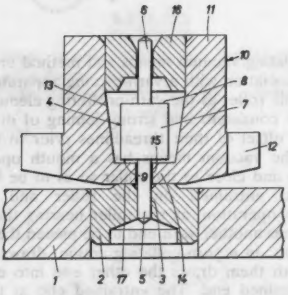
A crimpable composite textile filament having two longitudinally extending components, one of said components consisting essentially of poly(1,4-cyclohexylene dimethylene terephthalate) and the other component consisting essentially of poly(ethylene terephthalate).

3,626,443

PIVOTING ARRANGEMENT FOR MOVING PARTS OF TIMEPIECES

Jean-Claude Schneider, La Chaux-De-Fonds, Switzerland, assignor to Fabrique d'Horlogerie Chs. Tissot et fils S. A., Le Locle, Canton of Neuchatel, Switzerland

Filed Sept. 15, 1970, Ser. No. 72,532
Claims priority, application Switzerland, Sept. 26, 1969, 14571/69
Int. Cl. G04b *13/02, 31/00*
U.S. Cl. 58—140 R 6 Claims



A bearing for rotating or oscillating parts of timepieces. A supporting shaft is fixed in the plate and the moving part rotates about it. Axial play of the moving part is limited in one direction by coaction between an inwardly extending flange of the moving part and a wide portion of the shaft and in the other direction by coaction between said flange and the plate or something fixed to it.

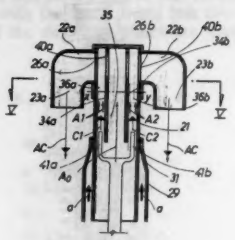
3,626,444

IMPROVEMENTS IN LIQUID FUEL VAPORIZING COMBUSTION SYSTEMS

Jacques Emile Jules Caruel, Dammarie-les-Lys; Armand Jean-Baptiste Lacroix, Itteville, and Herve Alain Quillevere, Issy-les-Moulineaux, all of France, assignors to Societe Nationale D'Etude et de Construction de Moteurs D'Aviation, Paris, France

Filed Oct. 30, 1969, Ser. No. 872,605
Claims priority, application France, Nov. 4, 1968, 172477
Int. Cl. F02c *3/22*
U.S. Cl. 60—39.71 5 Claims

A T-shaped liquid fuel prevaporizing device for a combustion chamber, said device comprising a tubular shank projecting into the combustion chamber and two arms projecting from the downstream section of said shank to open into the combustion chamber, wherein overheating of the device is minimized by compartmenting the downstream section of the tubular shank by longitudinal partitions to form separate but



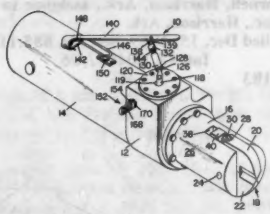
intercommunicating passages which are selectively fed with combustion air alone and with fuel/air mixture.

3,626,445

HYDRAULIC POWER TOOL

Alonzo L. Penix, New Braintree Road, W. Brookfield, Mass.

Filed Mar. 13, 1970, Ser. No. 19,295
Int. Cl. F15b *15/18;* B26b *17/00*
U.S. Cl. 60—52 US 3 Claims



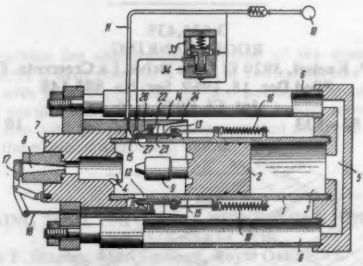
A motorized hand tool including a relatively small electric motor arranged to drive a new and improved pump which operates a piston to reciprocate a thrust block to close for instance a pair of jaws, cutters, or the like, in combination with a new and improved hand controlled valve for the pump, including a single handle having means for turning the motor on and off and to control the pump moving the valve between off and on positions.

3,626,446

DEVICE FOR BUILDING UP HIGH-PRESSURE IMPULSE JETS OF LIQUID

Faina Fedorovna Voltsekhovskaya, ulitsa Akademicheskaya, Kottedzk 2, Novosibirsk, U.S.S.R.

Filed Nov. 4, 1969, Ser. No. 873,860
Int. Cl. F15b *7/00*
U.S. Cl. 60—54.5 HA 4 Claims



The present invention provides a device for building up high-pressure impulse jets of liquid upon an impact delivered by a piston accelerated by compressed gas upon liquid disposed in a chamber provided with an aperture for the liquid outflow by jets; to bring the piston back to its initial position after an impact, the space of the cylinder before the piston being communicated with a liquid-supplying pressure

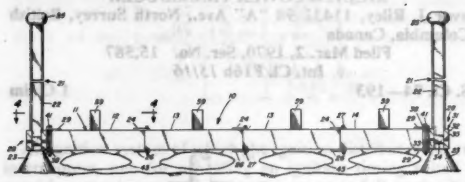
main, and, to drain the liquid during the piston acceleration, the sidewalls of the cylinder are provided with drain apertures overlapped by a movable member of a locking mechanism.

3,626,447

PORTABLE AIR INFLATED DRYDOCK

Harry O. Hindlin, 5715 E. Hastings Arch, Virginia Beach, Va.

Filed Oct. 22, 1969, Ser. No. 868,330
Int. Cl. B63c 1/06
U.S. Cl. 61—46.5 4 Claims



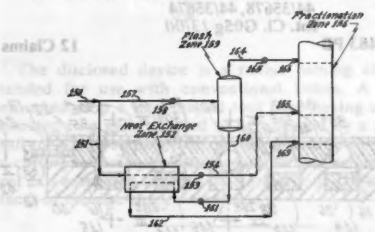
A portable drydock for larger boats and small ships comprising a chock equipped platform and inflatable pontoons attached to the underside thereof. The platform is retained in all horizontal directions and guided in its upward and downward movements by an upright guide rail at each corner thereof which has a pedestal of concrete resting on the bottom of the body of water in which the drydock is located and which rail extends above the water being surmounted by a marker. The boat or ship is maneuvered between the markers at each side of the platform and the pontoons are inflated to float the platform and raise the vessel from the water on the chocks.

3,626,448

SEPARATION OF LOW-BOILING GAS MIXTURES

Duffer B. Crawford, Westfield, N.J., and Johannes C. Norenburg, New York, N.Y., assignors to Pullman Incorporated, Chicago, Ill.

Original application Aug. 1, 1967, Ser. No. 657,662, now Patent No. 3,543,528, which is a continuation-in-part of application Ser. No. 438,900, Mar. 11, 1965, now abandoned. Divided and this application Feb. 27, 1970, Ser. No. 14,939
Int. Cl. F25j 1/00, 3/02
U.S. Cl. 62—24 4 Claims



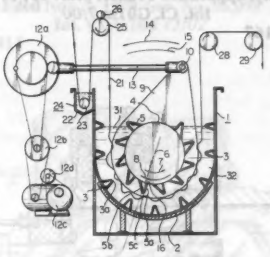
A process for prefractionation of a feed mixture comprised of at least two components prior to introduction to the main fractionation zone, wherein substantially liquid feed maintained at pressures higher than that prevailing in the fractionation zone is cooled by indirect heat exchange, part or all of said cooled feed is flashed at a pressure at least above that of the fractionation zone, to produce flashed material having a liquid phase and vapor phase. The refrigeration potential of the flashed material is utilized for cooling of the feed by indirect heat exchange with a liquid or mixed phase portion of said flashed material thereby increasing the vapor-to-liquid ratio of the latter prior to its introduction to the fractionation zone at a suitable point. Remaining feed is introduced to the fractionation zone at one or more other suitable points. Preferred feeds disclosed are nitrogen-containing mixtures, such as mixtures comprising nitrogen and methane, nitrogen and argon, nitrogen, methane and argon. A specific example is included as to the application of the invention to the separation of the individual components of an ammonia synthesis purge gas and to the recovery of argon in either liquid or gaseous form.

3,626,449

APPARATUS FOR CONTINUOUSLY RELAXING TEXTILE MATERIAL IN A TREATING LIQUID

Masahiro Arashi, Komatsu-shi, Japan, assignor to Komatsu Seiren Co., Ltd., Ishikawa-ken, Japan

Filed Jan. 23, 1970, Ser. No. 5,336
Int. Cl. B05c 3/136
U.S. Cl. 68—158 10 Claims



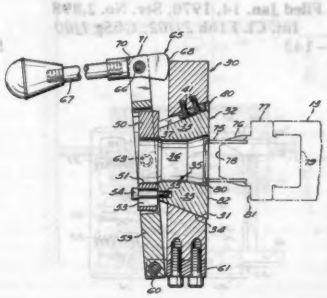
The relaxing apparatus of the present invention comprises a treating bath having a plurality of hurdle projections mounted on the inside surface of the treating bath and a cylindrical rotor facing the inside surface of the treating bath, the rotor is reciprocally rotatable at a predetermined angle, preferably 20° to 45° and has a plurality of paddle projections mounted on the peripheral surface of the rotor. The paddle projections are effective for paddling a treating liquid in the treating bath so as to exert a crumpling action to the material charged in the treating bath. The hurdle projections are effective for enforcing the crumpling action presenting an obstacle to movements of the material and treating liquid. The material can be continuously and sufficiently relaxed the treating liquid by the crumpling action.

3,626,450

PORTABLE SWAGING TOOL

Frederick S. Browne, Euclid, and Hiralal V. Patel, Cleveland, both of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Aug. 12, 1969, Ser. No. 849,425
Int. Cl. B21d 41/00
U.S. Cl. 72—402 6 Claims



In an apparatus for swagging a sleeve onto a tubular member inserted therein, the swagging die is split into three

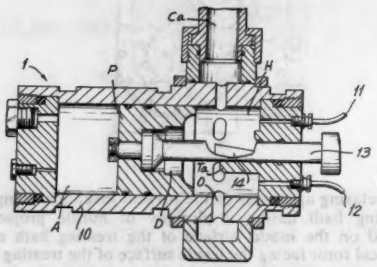
identical segments, each of which is provided with an internal swagging die portion and an externally coned outer surface. The externally coned surface of each die segment is keyed to an internally coned socket member, so that displacement of the die segments with respect to the socket member opens and closes a swagging die cavity defined by the three die portions to permit loading and removing the sleeve and tubular member. The die segments are displaced by an actuator which includes a pusher plate and a cam acting between the pusher plate and the socket member. The pusher plate is connected to the die segments by a connector that permits relative radial movement between each die segment and the pusher plate.

3,626,451

APPARATUS AND METHOD FOR THE DYNAMIC TESTING OR ORDNANCE

Michel Philippe Lucien Bourgeot, Bourges, France, assignor to Etat Francais, Paris, France

Filed Mar. 19, 1970, Ser. No. 20,899
Claims priority, application France, Mar. 19, 1969, 6907896
Int. Cl. G01m 7/00
U.S. Cl. 73—167 **5 Claims**



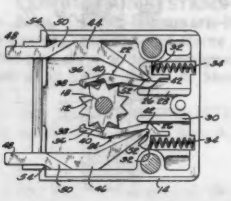
A thrust unit is placed in contact with the nozzle of an artillery piece and a power unit applies dynamic force to the thrust unit and thus to the artillery piece to simulate firing of the artillery piece, the power unit has a piston which compresses nitrogen in a closed chamber, and a control unit holds the piston in place with the nitrogen compressed. The control unit is adapted to release the piston and allow the same to displace under the pressure of the nitrogen, the piston being coupled to the thrust unit.

3,626,452

MULTIPOSITION BIDIRECTIONAL ROTARY MEANS FOR A SWITCH OR THE LIKE

Ronald C. Winter, Johnson Creek, and Enno Knief, Watertown, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Jan. 14, 1970, Ser. No. 2,898
Int. Cl. F16h 21/02; G05g 1/00
U.S. Cl. 74—143 **5 Claims**



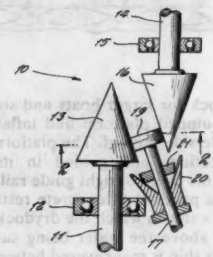
Multiposition bidirectional rotary means for a switch or the like includes a rotary ratchet operated by two actuating levers. Two advance levers slidably and pivotally mounted to engage this ratchet from opposite radial directions. Each advance lever has means for engaging the ratchet to rotate the ratchet one step to an adjacent position and means to engage the ratchet and releasably hold it in a position. One lever rotates it in one direction the other lever rotates it the opposite direction. Springs urge each advance lever toward the ratchet and tangentially thereof toward projected at rest pcsitions. The push levers have projections to engage the advance levers for effecting lineal sliding movement and permitting pivoting of such advance levers relative to the ratchet and the push levers.

3,626,453

RILJACK POWER TRANSDUCER

Trevor J. Riley, 11431 94 "A" Ave., North Surrey, British Columbia, Canada

Filed Mar. 2, 1970, Ser. No. 15,587
Int. Cl. F16h 15/16
U.S. Cl. 74—193 **1 Claim**



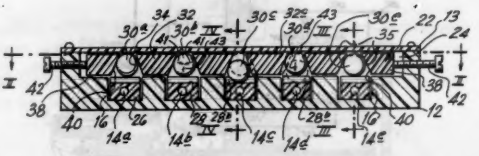
A motion transmission device for producing variable speed and power and which comprises a cone on a driven shaft and a cone on a driving shaft, the cones having a cylindrical driving wheel therebetween that is slideable between the cones and engaging the cylindrical sides thereof, the position of the intermediate driving wheel determining the relative speed of the cones.

3,626,454

PUSHBUTTON DEVICE

Hideo Yokoyama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 20, 1970, Ser. No. 21,403
Claims priority, application Japan, Mar. 27, 1969, Mar. 27, 1969, Apr. 18, 1969, Apr. 19, 1969; 44/23291, 44/27269, 44/35678, 44/35874
Int. Cl. G05g 13/00
U.S. Cl. 74—483 PB **12 Claims**



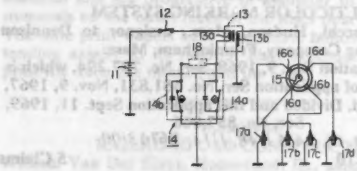
In a pushbutton control device having a plurality of actuator members movable between first and second positions within a support housing for operating associated switches or the like, each actuator is biased towards its first position and is provided with an associated detent member for retaining its respective actuator in its second position, and the individual detent members are interconnected by a force transmitting mechanism which is adapted to release the detent member of an actuator in its second position to permit return of that actuator to its first position in response to movement of any other actuators to its second position.

3,626,455

IGNITION TIMING RESPONSIVE TO TRANSMISSION SETTING

Yoshio Toda; Mitsutaka Konno, both of Yokohama; Masao Nakajima, Kawasaki, and Toshitake Kikuchi, Yokohama, all of Japan, assignors to Nissan Motor Company, Limited, Yokohoma City, Japan

Filed Dec. 5, 1969, Ser. No. 882,532
Claims priority, application Japan, Dec. 10, 1968, Dec. 10, 1968, Feb. 5, 1969; 43/90054, 43/90055, 44/8257
Int. Cl. B60k *21/00*; F02p *5/00*; B60k *33/00*
U.S. Cl. 74—860 1 Claim



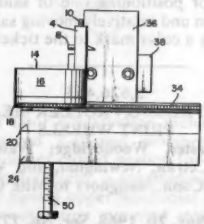
An ignition system of which the ignition distributor has two interruptors, one for providing an ignition timing suited to provide a maximum engine power output at full engine load and a minimum fuel consumption at light engine loads and the other providing an ignition timing retarded from the timing dictated by the former interruptor, the latter interruptor being connected with the ignition coil through a control switch operating in accordance with the transmission setting, vehicle speed, engine speed vacuum in the throttle chamber of the carburetor or in the intake manifold of the engine, angular position of the throttle valve in the carburetor or combination of two or more of these factors.

3,626,456

RADIUS TURNING ATTACHMENT FOR LATHES

George William Freeborn, 21421 Moneta Ave., Carson, Calif.

Filed Aug. 4, 1969, Ser. No. 847,267
Int. Cl. B23b *5/40*
U.S. Cl. 82—12 6 Claims



The disclosed device is a radius turning attachment intended for use with conventional lathes. A tool post is mounted atop a disc-shaped tool base having a peripherally situated ring gear adapted to be engaged by a movable gear rail support member which serves to rotate the tool post, and a cutting tool mounted thereon, about a predetermined vertical axis extending through the center points of the planar surfaces of the disc-shaped tool base.

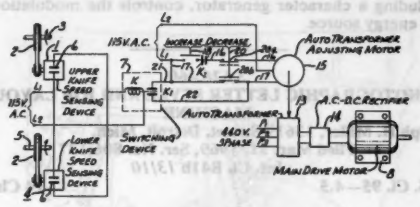
3,626,457

SENTINEL CONTROL FOR CUTOFF APPARATUS

Lorenz K. E. Duerr, Coram, N.Y., and Charles D. Nitchie, Ruxton, Md., assignors to Koppers Company, Inc.

Filed Mar. 5, 1970, Ser. No. 16,690
Int. Cl. B23s *25/12*
U.S. Cl. 83—74 9 Claims

A sentinel control in cutoff apparatus having rotatable cutting means for cutting sheets of uniform length from a moving web of material fed to the apparatus to prevent the rotational velocity (revolutions or cuts per second) of the cutting means for exceeding a predetermined maximum or threshold limit rotational velocity and thereby prevent possible damage and destruction to the cutoff apparatus caused by



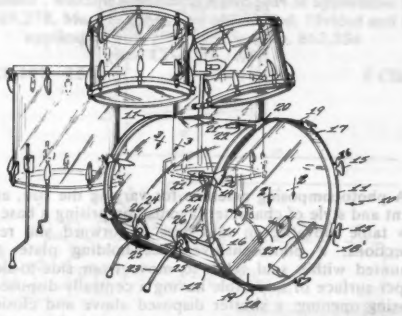
the heavy inertia forces imposed upon the apparatus when operated at velocities in excess of maximum desired limit.

3,626,458

DRUMS

William Zickos, 9302 West 89th St., Overland Park, Kans.

Filed Nov. 2, 1970, Ser. No. 86,099
Int. Cl. G10d *13/02*
U.S. Cl. 84—411 2 Claims



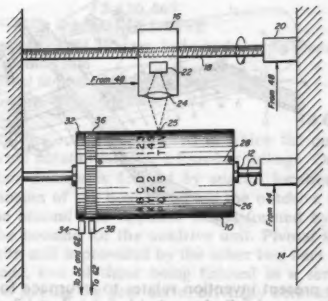
A drum having transparent shell and heads whereby the performer thereon can be completely viewed during his performance.

3,626,459

GRAPHIC ARTS PRINTER

Dan J. Haflinger, Rancho Santa Fe, and Omer F. Hamann, La Jolla, both of Calif., assignors to Stromberg Datagraphix, Inc., San Diego, Calif.

Filed Feb. 19, 1970, Ser. No. 127,300
Int. Cl. H04n *5/84*; H04l *15/34*
U.S. Cl. 95—4.5 R 3 Claims



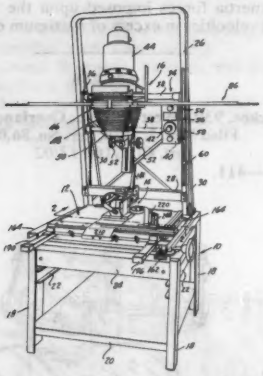
A printer in which a continuously rotating drum carries an energy sensitive recording medium on which characters are

formed by a modulated energy source such as light. Characters are formed by a plurality of line segments generated during successive revolutions of the drum. Electronic circuitry including a character generator, controls the modulation of the energy source.

3,626,460
PHOTOGRAPHIC LETTER STYLE AND JOB LAYOUT MACHINE

Ralph H. Miller, 13619 Sunset, Detroit, Mich.

Filed Mar. 11, 1969, Ser. No. 806,137
Int. Cl. B41b *13/10*
U.S. Cl. 95—4.5 **14 Claims**

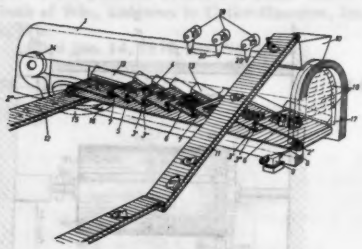


A photocomposing machine for varying the size, arrangement and style of character layouts comprising a base, a hollow table movable on said base in forward and rearward directions, a photosensitive sheet-holding plate slidably mounted within said table to move from side-to-side, the upper surface of said table having a centrally disposed light-passing opening, a shutter disposed above and closing said opening, a photographic enlarger mounted above said table including a holder for a film strip having transparent characters, means for vertically adjusting said enlarger and aligning the same with said table opening and shutter, and means for opening and reclosing said shutter.

3,626,461
INCINERATOR

Kristian Pedersen Munk, Kalundborg, Denmark, assignor to Keller Ofenbau G.m.b.H., Carl-Keller-Strasse, Germany

Filed Mar. 13, 1970, Ser. No. 19,446
Int. Cl. F23g *5/12*
U.S. Cl. 110—8 C **4 Claims**



The present invention relates to a furnace for combustion of refuse, especially household and industrial refuse, and of the type comprising a horizontal chute with a transporting gate arranged longitudinally in said chute.

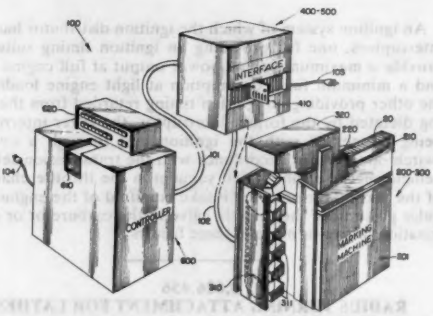
The object of the invention is to provide a furnace of the above stated art which can be erected and installed easily and for low-costs, and which also can be arranged in unused brick kilns, especially such of the Hoffmann-type. Another object of the invention is to provide a furnace in which complete combustion of the refuse is secured maintaining a relatively low-temperature under and in the grate itself, but maintaining a maximum temperature in a range of about 800° C. in order to remove odor from undesired odors in the flue gas.

These and following objects are apparent from and are achieved with the following disclosure.

3,626,462
MULTICOLOR MARKING SYSTEM

Richard F. Stucchi, Hudson, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original application Dec. 9, 1968, Ser. No. 787,294, which is a continuation of application Ser. No. 681,831, Nov. 9, 1967, now abandoned. Divided and this application Sept. 11, 1969, Ser. No. 857,066
Int. Cl. B41f *1/48, 1/14;* **B67d** *3/00*
U.S. Cl. 101—210 **5 Claims**

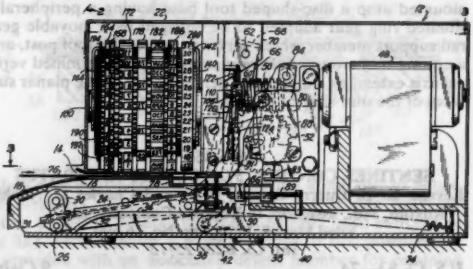


A device for applying a color mark to a ticket or the like; the device including a number of different color applications adapted to be positioned at a marking station. Transfer means for positioning a ticket at a marking station and a control mechanism for positioning one of said applicators and the marking station and relatively moving said ticket and said applicator to apply a color mark to the ticket.

3,626,463
TRAVELING IMPRESSION ROLLER MEANS FOR TIME PRINT WHEELS

Gerhard A. Foerster, Woodbridge; Walter Wolog, New Haven; Louis Cetran, Newington, and William P. Ryan, Bethany, all of Conn., assignors to Mite Corporation, New Haven, Conn.

Filed Nov. 20, 1968, Ser. No. 777,218
Int. Cl. B41f *3/02;* **G01d** *15/20*
U.S. Cl. 101—269 **11 Claims**



The present time stamp eliminates the usual hammer and solenoid with their impact noise. Instead, a carriage is mounted for reciprocating travel along the print wheels, and an impression roller carried by the carriage serves to press

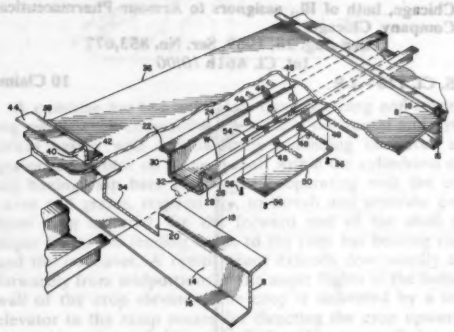
successive parts of a document against the print wheels. The desired print is thus obtained by means of a quiet rolling action rather than by a noisy hammer impact. There is smooth acceleration and deceleration of the carriage, thereby further avoiding noise and vibration. There are print wheels for date, month, year and the time in hours and minutes. Most of the print wheels are moved by pawl and ratchet mechanism. A timing motor drives a cam and cam follower to operate the pawl, and the cam configuration causes smooth acceleration and deceleration of the pawl movement, which again contributes to quiet operation. The time print wheels are provided with separate readout discs. These are made of sheet material and are progressive in diameter to expose readout numerals on the outer faces of the discs near their periphery. The time print wheels have concentric hollow shafts each extending axially to its readout disc. Additional print wheels print the date, the month, and the year.

3,626,464

RAILROAD CAR CONSTRUCTION

William Van Der Sluys, Homewood, Ill., assignor to Pullman Incorporated, Chicago, Ill.

Filed Apr. 22, 1969, Ser. No. 818,269
Int. Cl. B61d *1/00, 1/12*
U.S. Cl. 105—418 **7 Claims**



A railroad car floor construction including a plurality of longitudinally spaced Z-shaped crossbearers, each crossbearer having an upper cutout portion for receiving and supporting a wire duct therein, a longitudinally extending hat-shaped wire duct having upper horizontal laterally extending flanges, a subfloor structure mounted atop the upper flange portion of the Z-shaped crossbearers, the flanges of said wire duct being attached to the underside of said subfloor with the wire duct extending in the wire duct cutout of each of the crossbearers, Z-shaped crossmembers mounted on top of the subfloor structure and over a respective crossbearer top flange, the top flange of each crossmember being spaced longitudinally of another and adapted to receive thereover the top floor sheeting, the wire duct being perforated to receive the wiring therein longitudinally of the car.

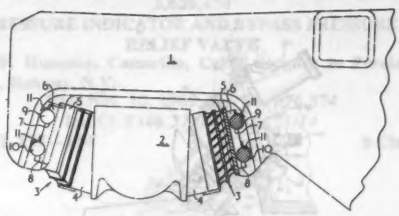
3,626,465

ELASTOMERIC RAILWAY AXLE SPRING

Archie John Hirst, Leicester, England, assignor to The Dunlop Company Limited, London, England

Filed Sept. 17, 1969, Ser. No. 858,701
Claims priority, application Great Britain, Sept. 19, 1968, 44,465/68
Int. Cl. B60b *35/16;* **B61f** *5/30, 5/34*
U.S. Cl. 105—224.1 **7 Claims**

A vehicle axle suspension spring formed from at least one block of resilient material arranged between metal end plates, one end plate being arranged to be associated with one end of the axle and the other end plate having two spaced semicircular recesses formed therein for engagement with a pair of correspondingly spaced pins associated with a



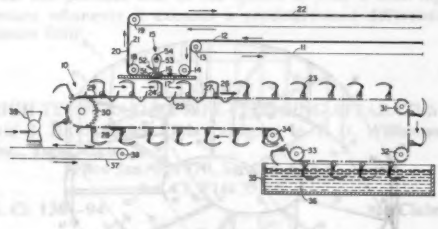
support structure of the vehicle body, so locating the spring relative to the support structure.

3,626,466

MOLDING DEVICE FOR PREPARING CHIP-TYPE PRODUCTS

Alexander L. Liepa, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Original application Oct. 31, 1967, Ser. No. 683,083, now abandoned , which is a continuation-in-part of application Ser. No. 569,278, Mar. 1, 1966, now abandoned. Divided and this application July 14, 1969, Ser. No. 862,556
Int. Cl. A21c *11/00*
U.S. Cl. 107—15 **5 Claims**



Method and apparatus for continuously preparing fried products from a sheet of edible dough including an infeed conveyor to carry the sheet of dough; a cutter for cutting pieces the desired size from the sheet; a shaper-molder utilizing movable, apertured mold halves to shape the cut pieces to the desired surface conformation and hold them during subsequent processing; and a reservoir containing a frying medium through which the shaped, restrained pieces are passed until they are fried to a crisp state. The fried objects assume a final shape defined by the shaper-molder.

3,626,467

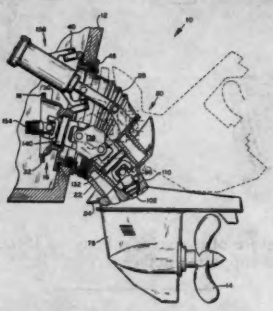
MARINE DRIVE

Philip J. Mazziotti, Fort Wayne, Ind., assignor to Dana Corporation, Toledo, Ohio

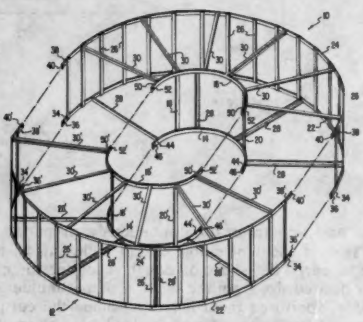
Filed Sept. 3, 1969, Ser. No. 854,841
Int. Cl. B63h *5/12*
U.S. Cl. 115—41 **10 Claims**

A marine outdrive unit is disclosed in which the outdrive unit is supported substantially on a four-bar linkage. One bar of the four-bar linkage is formed by spaced locations adjacent the transom of the boat on which the outdrive unit is mounted. The second and opposite bar is formed by fixed portions of the housing for the outdrive unit. Pivotal kickup and trim for the unit is provided by the other two bars of the four-bar linkage, one of these being formed in a series of universal joints joining the gear drive, drivingly connected to the marine engine, to the shafting driving the propeller for the marine outdrive unit. The last bar of the four-bar linkage is provided by a hydraulic means which is pivotally attached to the outdrive unit at its piston end and mounted adjacent to the transom. Thus, retraction of the hydraulic piston means

causes tiltup of the outdrive unit for either the trim or kickup function. The hydraulic piston means is also pivotally mounted on the transom on an angularly extending axis relative to the vertical so that steering of the outdrive unit may be obtained by movement of the hydraulic piston means, pivotally, relative to this axis.



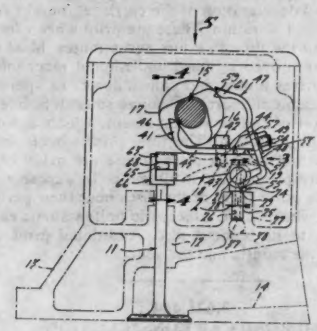
3,626,468
CREEP FOR AN ANIMAL FEEDER
James E. Hanson, Carter, S. Dak.
Filed July 25, 1969, Ser. No. 844,992
Int. Cl. A01k *5/00*
U.S. Cl. 119—60 **3 Claims**



A creep comprises an open framework including a pair of separate, rigid, substantially semicircular sections which are secured to one another to provide an assembled circular framework having a central circular opening for receiving a conventional animal feeder. The creep includes spaced vertical members at the outer periphery thereof to limit access to the interior of the creep, and weather protection means is supported at the upper inner portion of the creep.

3,626,469
VALVE GEAR
Gerald J. Ashley, 23465 Lee Baker Drive, Southfield, Mich.
Filed Nov. 12, 1968, Ser. No. 775,063
Int. Cl. F01l *1/30, 1/18, 1/04*
U.S. Cl. 123—90.25 **11 Claims**

A positively operated valve gear for an internal combustion engine embodying pivotally supported rocker arms that carry detachable spring fingers which fingers engage cams on a camshaft for pivoting the rocker arms upon rotation of the camshaft. The rocker arm is pivotally connected to the engine poppet valves for positively transmitting movement to these valves and may be formed as a casting, forging or stamping. The pivotal connection between the rocker arms and poppet valves is accomplished through an improved keeper arrangement. The rocker arm acts as a third-class lever so that the valves can be disposed on opposite sides of the axis of the rotation of the camshaft giving greater latitude to the positioning of the valves relative to the cylinder bore.



3,626,470
DIAGNOSTIC DEVICE FOR OBTAINING CYTOLOGIC SAMPLES
Harold J. Antonides, Kankakee, and M. Budd Mittleman, Chicago, both of Ill., assignors to Armour Pharmaceutical Company, Chicago, Ill.
Filed Aug. 28, 1969, Ser. No. 853,677
Int. Cl. A61b *10/00*
U.S. Cl. 128—2 R **10 Claims**

A diagnostic device for obtaining cytologic samples such as in collecting cervical and endocervical cell specimens for Papanicolaou smear testing and the like, is described. The device comprises an elongated handle carrying a flexibly coupled platform member upon which a spongelike pledget is uniquely formed, the latter being impregnated with a critical amount of a proteolytic enzyme. The characteristic properties of the proteolytic enzyme facilitate cellular defoliation and sampling, and improved diagnostic examination of the cells so collected by inducing lysis of the obscuring mucus which occurs at or near the cervical site.

3,626,471
ILLUMINATED SUCTION BRAIN RETRACTOR
Robert E. Florin, 14909 Lodsa Drive, Whittier, Calif.
Filed Oct. 13, 1969, Ser. No. 865,675
Int. Cl. A61b *17/02*
U.S. Cl. 128—20 **4 Claims**

A surgical tool comprising a brain retractor is shaped so that it may pass through an opening in the skull. The tool has an arched blade with a concave lower surface, flat in cross section, and a pair of tubes mounted on the marginal edges of the arched blade are flush with the lower surface thereof. Both tubes may be connected to a source of suction pressure

for removal of fluids from the operating area, or only one may be so connected, with the other supplying a flushing

fluid. A curved fiber optic element is mounted upon the arched blade between the tubes to illuminate the operating area.

3,626,472

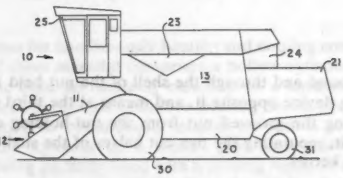
MEANS FOR FEEDING CROP MATERIAL TO AN AXIAL FLOW THRESHING AND SEPARATING COMBINE

Edward William Rowland-Hill, New Holland, Pa., assignor to Sperry Rand Corporation, New Holland, Pa.

Continuation-in-part of application Ser. No. 790,145, Jan. 9, 1969. This application Nov. 24, 1969, Ser. No. 879,214

Int. Cl. A01f *7/06*

U.S. Cl. 130—27 T **13 Claims**



A combine has two axial flow type threshing and separating means each comprising a generally horizontal and cylindrical casing with longitudinally extending concaves and grates and a rotor on an axial shaft within the cylindrical casing having rasp bars and blades cooperating with the concaves and grates, respectively, to thresh and separate grain from crop material. On the forward end of the shaft are auger flights for feeding crops to the rasp bar bearing rotor and the concaves. A ramp means extends downwardly and forwardly from midportions of the auger flights to the bottom wall of the crop elevator. The crop is delivered by a crop elevator to the ramp means for directing the crop upwardly into midportions of the auger flights. The auger flights and stripper bars on the sides of the casings cooperate to deliver the crop material to the rasp bar bearing rotors at the ends of the respective threshing actions.

3,626,473

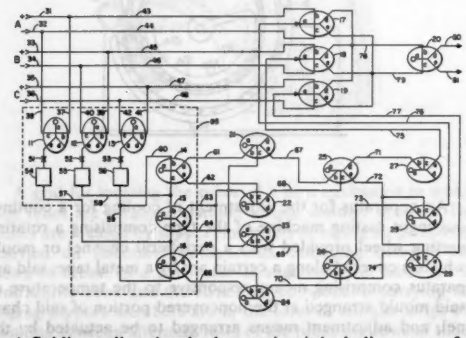
FLUIDIC MEDIAN SELECTOR

Walter M. Posingies, Edina, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed May 23, 1969, Ser. No. 827,247

Int. Cl. F15c *1/12*

U.S. Cl. 137—81.5 **4 Claims**



A fluidic median signal selector circuit including means for comparing signals, logic means, and signal-switching means, whereby the one of three input signals which is median in value is passed to the output.

3,626,474

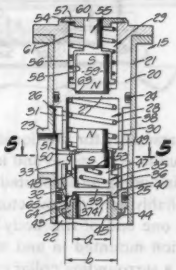
PRESSURE INDICATOR AND BYPASS PRESSURE RELIEF VALVE

Kurt F. Hammer, Camarillo, Calif., assignor to Purolator, Inc., Rahway, N.Y.

Filed Nov. 13, 1969, Ser. No. 876,374

Int. Cl. F16k *37/00;* **B01d** *35/14*

U.S. Cl. 137—554 **6 Claims**



An indicator and bypass pressure relief device for use in a system having a high-pressure side and a low-pressure side, which indicates or signals an increase of pressure in the high-pressure side of the system beyond a predetermined differential limit; and bypasses fluid from the high-pressure side to the low-pressure side of the system to relieve such high pressure whenever it exceeds a predetermined differential pressure limit.

3,626,475

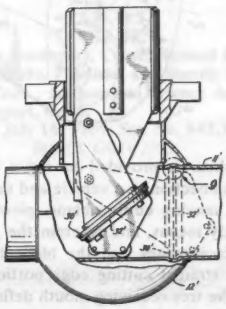
HIGH TEMPERATURE PIPE-PLUGGING APPARATUS

David J. Hicks, Tulsa, Okla., assignor to T. D. Williamson Inc., Tulsa, Okla.

Filed Jan. 5, 1970, Ser. No. 673

Int. Cl. F16l *55/10*

U.S. Cl. 138—94 **14 Claims**



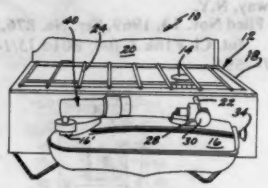
The high temperature pipe plugger disclosed uses a backup plate for the sealing element on the plugging member that provides substantially complete support for the sealing element against the differential pressure imposed on the element by the hot fluid in the pipe. The backup plate may either deform the pipe to match its outside diameter or the pipe may deform the plate to match its inside diameter depending on the material from which the plate is made and the shape of the pipe. A method of isolating a leak in a superheated steam line is also disclosed. The method locates the pipe plugs far enough away from the bypass openings for the steam adjacent the plug, being removed from the flowing stream, to lose its superheat quickly and thereby reduce the temperature at which the sealing element of the plugging member must operate while the line is being repaired.

3,626,476

FUEL TANK PRESSURIZER

John G. Trumble, 160th Ave., Big Rapids, Mich.

Filed Aug. 6, 1969, Ser. No. 847,910
Int. Cl. F24c 5/00; B67b 7/24
U.S. Cl. 141—329 1 Claim



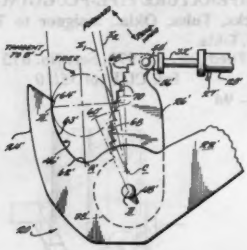
Fuel tank cap assembly for the liquid fuel tank of portable camping burner units, e.g., stoves and lanterns, but especially camping stoves, including an elongated main body to receive and allow controllably actuated puncture of a pressurized gas cylinder therein, one end of this body having a support and gas passage portion mounted in and transverse to the main body and having a surrounding collar connectable to the fuel tank spout to cause the pressurized capsule-containing body to lie closely alongside the fuel tank.

3,626,477

TIMBER SHEAR

Oscar T. Fulghum, Jr., Wadley, Ga., assignor to Fulghum Enterprises, Inc., Wadley, Ga.

Filed Oct. 30, 1969, Ser. No. 872,633
Int. Cl. A01g 23/02
U.S. Cl. 144—34 E 7 Claims



A timber shear is provided having a main body means adapted for connection to a vehicle and including a stationary jaw and a moving cutting blade, pivotally connected to said main body means, and wherein the jaw has a tree-engageable surface means and the blade has a substantially rectilinear or straight cutting edge portion disposed at the open end of the tree receiving mouth defined by the jaw and the blade, and with the tree-engageable surface on the jaw and the straight cutting edge portion of the blade being so arranged that when a tree is disposed in the mouth and the blade is pivoted toward the jaw, there is a tendency for the tree and shear to be drawn together.

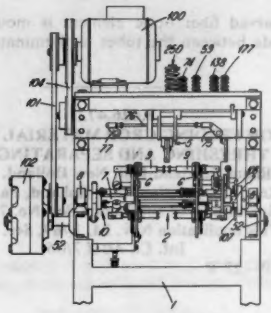
3,626,478

CASHEW NUT DECORTICATING MACHINE

Frederick Lawton, Dar Es Salaam, Tanzania, assignor to Tanzania Cashew Machines Limited, Dar es Salaam, Tanzania

Filed July 23, 1969, Ser. No. 844,128
Claims priority, application Great Britain, Sept. 11, 1968, 43,149/68
Int. Cl. A23n 5/04
U.S. Cl. 146—10 6 Claims

A cashew nut decorticating machine comprises a rotatable turret having three nut holding devices equiangularly spaced about the axis of rotation, means for rotating the turret in stepwise manner so that, after each step of rotation, each nut-holding device is opposite one of three stations, means at the first station for supplying a single nut to the nut-holding device opposite it, means at the second station for cutting



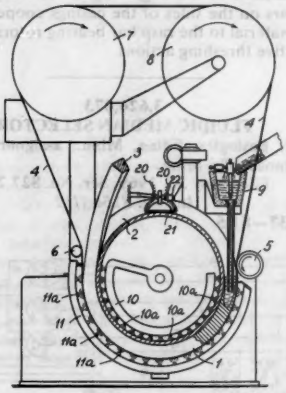
right round and through the shell of the nut held in the nut-holding device opposite it, and means at the third station for removing the grooved nut from the nut-holding device opposite it, separating the two cut halves of the shell and ejecting the kernel.

3,626,479

CONTINUOUS CASTING MACHINE WITH CHANNEL COOLANT CONTROL MEANS

Ilario Properzi, C/O Continuus S.p.A. Via Cosimo del Fante 10, Milan, Italy

Filed Nov. 24, 1969, Ser. No. 879,330
Claims priority, application Italy, Nov. 25, 1968, 24147A/68
Int. Cl. B22d 11/06
U.S. Cl. 164—154 5 Claims



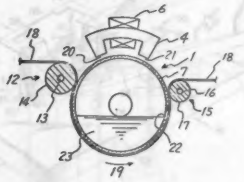
An apparatus for the adjustment of cooling for a continuous ingot casting machine of the type comprising a rotating casting wheel provided with a peripheral channel or mould which is covered along a certain arc by a metal tape, said apparatus comprising means responsive to the temperature of said mould arranged at the noncovered portion of said channel, and adjustment means arranged to be actuated by the temperature responsive means in order to adjust cooling means for cooling said mould.

3,626,480

DEVICE FOR HEATING AND COOLING PLASTIC SHEETS

Masuya Takei; Hideyuki Kawasaki, and Taira Yasuda, all of Takatsuki, Japan, assignors to Kuraray Co., Ltd., Osaka, Japan

Filed July 31, 1970, Ser. No. 59,914
Claims priority, application Japan, Aug. 11, 1969, 44/64577
Int. Cl. F26b *13/00*
U.S. Cl. 165—61 10 Claims



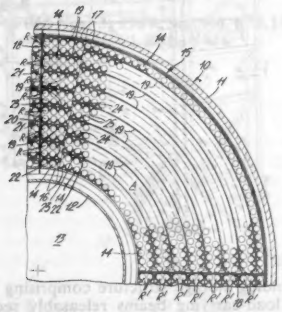
Apparatus for continuously heating and cooling continuous lengths of sheet material comprises a hollow cylinder of ferromagnetic material rotatably mounted on a horizontal axis, with an electromagnetic induction heating device placed in a fixed position to continuously inductively heat a peripheral area of the cylinder as it moves past that position, the cylinder being partially filled with a cooling liquid to continuously and successively cool the heated peripheral area and rollers to guide the sheet material successively in contact with the heated and cooled periphery of the cylinder.

3,626,481

HEAT EXCHANGERS

Derek Taylor, and Reginald Philip Hardingham, both of Knutsford, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Jan. 19, 1970, Ser. No. 3,961
Claims priority, application Great Britain, Jan. 28, 1969, 4,770/69
Int. Cl. F23d *7/00*
U.S. Cl. 165—162 7 Claims



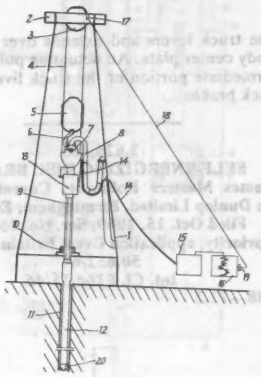
A grid for locating the tubes of a heat exchanger in which the tubes are arranged parallel to one another in rows. The tubes are located by support members of zigzag strip material carried on structural components extending between the rows of tubes. In a particular arrangement the tubes are in concentric rows and the structural components carrying the zigzag support members are in the form of annular strips extending between alternate rows of the tubes the rows of tubes on either side of the annular strips being supported by zigzag support members attached to each side of the annular strips.

3,626,482

METHOD AND APPARATUS FOR MEASURING LITHOLOGICAL CHARACTERISTICS OF ROCKS

Claude Jean Quichaud, Billere; Michel H. Raynaud, and Jean Lutz, both of Pau, all of France, assignors to Societe Anonyme dite: Societe Nationale des Petroles d'Aquitaine, Coubevoie, France

Filed Oct. 23, 1969, Ser. No. 868,873
Claims priority, application France, Oct. 30, 1968, Dec. 11, 1968, Feb. 27, 1969; 6905142, 177543, 171873
Int. Cl. E21b *47/00, 49/00*
U.S. Cl. 175—25 27 Claims



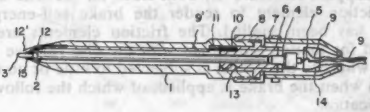
A method by which physical and mechanical characteristics of rocks are measured during drilling, comprises picking up a signal representing the vibrations of a train of rods forming part of drilling gear, selecting the components of the said signal which, after peak-clipping, are in a frequency band which is centered on, and preferably is related to, a characteristic frequency of the tool, establishing from the components thus selected, a value which is representative of the amplitude of the vibrations, and correlating this value with the drilling depth.

3,626,483

SPARK PEN

Albert Whetstone, Southport, Conn.; Samuel Fine, New City, N.Y.; William Banks, Fairfield, and Stanely Phillips, Trumbull, both of Conn., assignors to Science Accessories Corporation, Southport, Conn.

Filed July 16, 1969, Ser. No. 842,148
Int. Cl. G01v *1/02*
U.S. Cl. 181—0.5 10 Claims



A writing stylus for use as a graphical-input terminal for digital computers. The stylus will produce a fast rise time shock energy sound wave generated by a spark detectable by coordinately placed microphones, at the instant the spark is produced can be determined and recorded in digital form.

3,626,484

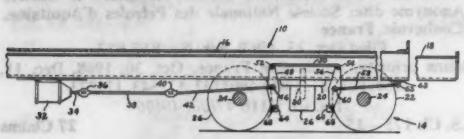
BRAKE RIGGING FOR RAILWAY FREIGHT CARS

Paul G. Kinnecom, St. Charles, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Sept. 22, 1969, Ser. No. 859,984
Int. Cl. B61h *13/26*
U.S. Cl. 188—52 3 Claims

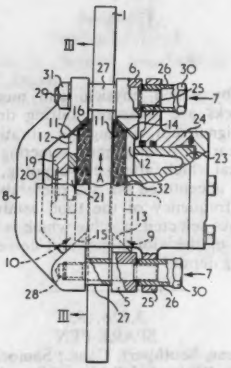
Brake rigging for a railway freight car having a center sill structure with an open bottom and receiving a portion of the

brake rigging. The truck live lever and the truck dead lever extend in a vertical direction and have upper end portions received within the center sill structure. A truck lever rod wholly within the center sill structure connects the upper



ends of the truck levers and extends over the truck bolster and the body center plate. An actuating pull rod is connected to an intermediate portion of the truck live lever for actuating the truck brakes.

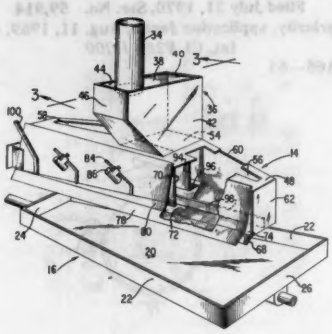
3,626,485
SELF-ENERGIZING DISC BRAKES
Aubrey James Masters Holloway, Coventry, England, assignor to Dunlop Limited, Birmingham, England
Filed Oct. 15, 1969, Ser. No. 866,514
Claims priority, application Great Britain, Oct. 25, 1968, 50,652/68
Int. Cl. F16d *55/46*
U.S. Cl. 188—72.2 **10 Claims**



Single-sided disc brake comprising a brake disc, a pair of opposed friction pads, a rigid brake support structure, a rigid caliper extending across the brake disc and a brake-actuating mechanism mounted on one limb of the caliper. Complementary abutment surfaces inclined towards the disc, are formed on the support structure on both sides on the disc and on each friction element to render the brake self-energizing, once it has been applied. The friction elements are both mounted for limited movement with the disc relative to the caliper, whereby the caliper is subjected to little or no torque reaction when the brake is applied, of which the following is a specification.

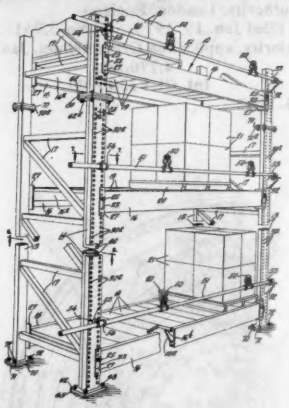
3,626,486
FLUID-DISTRIBUTION APPARATUS
Cecil W. Bugbee, and John G. Hicks, Jr., both of Tampa, Fla., assignors to Tennessee Corporation, New York, N.Y.
Original application Dec. 26, 1968, Ser. No. 787,101, now Patent No. 3,540,596, dated Nov. 17, 1970. Divided and this application Dec. 29, 1969, Ser. No. 1,943
Int. Cl. B01d *33/38*
U.S. Cl. 210—405 **2 Claims**

An improved slurry distribution box for use with moving bed filters, preferably a tilting pan vacuum filter is disclosed herein. The distribution box is a horizontally mounted box with a flat side transverse to the path of the filter pans, the flat side having a coextensive opening therein and a gate pivotally mounted from the top opposite the opening and acting together with the opening to define a discharge port. Adjustably mounted counterweights are cantilevered from the front of the gate to provide a biasing force to hold the gate against the opening. Preferably the gate is angularly bent at



its bottom to provide a slight taper to the discharge port formed by the gate and the opening so as to distribute slurry evenly over the annular filter surface area of the moving filter.

3,626,487
FIRE AND VERMIN RESISTANT STORAGE STRUCTURE HAVING FAIL-SAFE FEATURES
Edward A. Seiz, 136 E. Third St., Lansdale, Pa.
Continuation-in-part of application Ser. No. 728,182, May 10, 1968, now Patent No. 3,545,626. This application Mar. 3, 1970, Ser. No. 15,998
Int. Cl. A47f *5/10*
U.S. Cl. 211—176 **8 Claims**



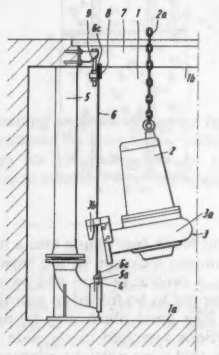
A free-standing storage structure comprising uprights and a series of load-carrying beams releasably secured to the uprights by means of improved locking assemblies on the ends of the beams projecting through knockout openings spaced apart along the length of each upright. Fire protection for the structure is provided by means of a wet upright having a conduit which contains a fire-retardant substance and which forms a structural component of the upright, the conduit being connected to pipes extending across the back of the structure for discharging the fire-retardant substance in response to a fire. Coupling means is provided to interconnect the conduits of aligned uprights when the structures are stacked vertically. Unused openings are closed by knockouts and the ends of the uprights and beams are closed to prevent vermin from inhabiting the storage structure.

3,626,488

GUIDE ARRANGEMENT

Anton Heumann, Nuernberg, Germany, assignor to Klein Schanzlin & Becker Aktiengesellschaft, Frankenthal Pfalz, Germany

Filed Feb. 5, 1970, Ser. No. 8,769
Claims priority, application Germany, Mar. 14, 1969, P 19 12 963.6
Int. Cl. B66b 7/06
U.S. Cl. 214—1 R 12 Claims



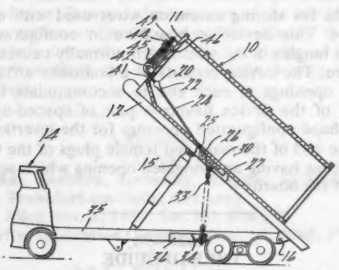
An article, particularly a pump unit, which is to be lowered from a higher to a lower level is clampingly connected by an annular clamp member which comprises two parallel, slightly spaced arms adapted during descent of the article to automatically slidably engage a pair of parallel guide wire sections extending vertically between the higher and lower levels. The guide-wire sections, in effect, are formed by one integral wire which in the region of the higher level, is deflected through 180° by means of a C-shaped deflecting member. The free ends of the guide-wire sections are connected in the region of the lower level.

3,626,489

TILT DUMP VEHICLE WITH LOAD EJECTING MEANS

Robert J. Pioch, Jackson, Mich., assignor to Kysor Industrial Corporation

Filed Nov. 3, 1969, Ser. No. 873,156
Int. Cl. B60p 1/04
U.S. Cl. 214—510 7 Claims



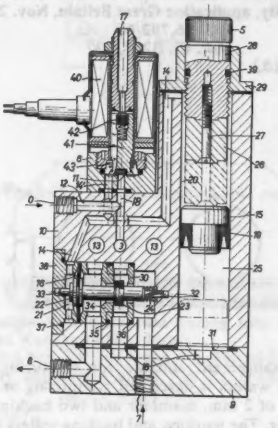
A closed body for a tilt-bed vehicle has an openable rear end and when raised pulls a cargo ejecting bar rearwardly inside the body to assist the discharge of the contents. A chain and cable mechanism actuates the ejecting bar by the lifting of the body.

3,626,490

LIQUID METERING APPARATUS

Heinz Rausch, Basel, Switzerland, assignor to Elektro-Apparatebau F. Knobel & Co., Ennenda, Glarus, Switzerland

Filed Jan. 26, 1970, Ser. No. 5,584
Claims priority, application France, Jan. 24, 1969, 6901409
Int. Cl. G01f 11/06
U.S. Cl. 222—334 5 Claims



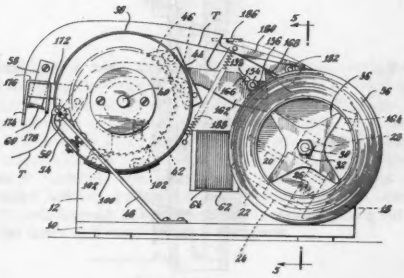
A liquid metering apparatus, particularly for distribution of beverages, comprises a metering or dosing container in which a metering piston is reciprocating, and a reversing valve controlling the filling and draining of the metering container. Actuation of the reversing valve and movement of the metering piston for draining the metering container is effected by means of an auxiliary medium controlled by an auxiliary magnetic control valve.

3,626,491

SOLENOID-OPERATED DISPENSER FOR PRESSURE-SENSITIVE TAPE

John H. Grosser, 148 Scofield Ave., Bridgeport, Conn.

Filed Aug. 27, 1969, Ser. No. 853,400
Int. Cl. B26f 3/02
U.S. Cl. 225—8 11 Claims



A roll of pressure-sensitive adhesive tape is mounted to be freely rotatable and its end is passed over a toothed tape feeding wheel which may be advanced in predetermined increments to draw tape off the roll. The end of the tape is manually lifted against a cutting edge which severs the tape and at the same time lifts a trigger mechanism. The trigger mechanism works through a time delay to close the switch. The switch in turn energizes a solenoid which has a plunger normally spring biased to its deenergized position. The plunger advances to its energized position, releasing the switch and simultaneously engaging the tape feeding wheel

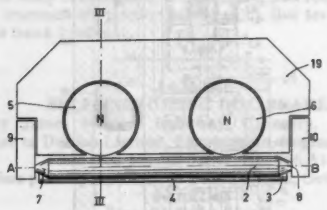
through a pawl and ratchet arrangement. When the springs return the plunger to its deenergized position, they simultaneously advance the tape feeding wheel.

3,626,492

MEANS FOR FRACTURING A PLATE OF MATERIAL

Kenneth Hobbs, Southampton, England, assignor to U.S. Philips Corporation

Filed Nov. 25, 1969, Ser. No. 879,845
Claims priority, application Great Britain, Nov. 29, 1968, 56,792/68
Int. Cl. B26f *3/00*
U.S. Cl. 225—103 **8 Claims**



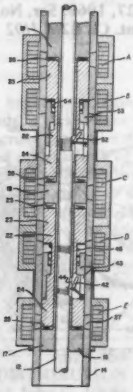
A roller arrangement suitable for fracturing into dice semiconductor wafers is described comprising an unpivoted working roller of 2 mm. diameter and two backing rollers of 5 mm. diameter. The working and backing rollers are of magnetic material and the working roller is held against the backing rollers using a magnet. Such a roller arrangement is satisfactory when the surface area of the dice is only 350 microns by 350 microns.

3,626,493

GRIPPER-TYPE LINEAR MOTION DEVICE

Peter F. Behmke, Tolland, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 18, 1969, Ser. No. 834,465
Int. Cl. B65h *17/36*
U.S. Cl. 226—54 **7 Claims**



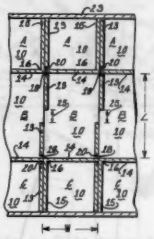
A linear motion device of the type in which magnetic coils surround a shaft lifting and lowering slugs which contain gripper elements which in turn may be selectively engaged and disengaged from the shaft. An upper coil operates to lift an upper slug while an upper central coil operates to effect engagement between the shaft and the upper slug. A lower coil operates to pull down a lower slug while a lower central coil operates to effect engagement between the lower slug and the shaft. The single central coil operates to simultaneously pull down the upper slug and lift the lower slug whereby two lifting steps are accomplished in each cycle of the lifting device.

3,626,494

PARTITION UNIT AND METHOD OF MAKING SAME

Lloyd L. Levin, Reading, Pa., assignor to Interstate Container Corporation, New York, N.Y.

Filed Nov. 20, 1969, Ser. No. 878,513
Int. Cl. B65d *5/48, 85/00*
U.S. Cl. 229—15 **23 Claims**



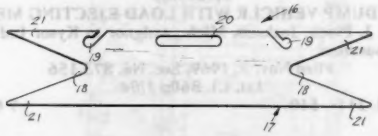
A one piece die-cut blank for folding into a multicell partition unit for insertion into a carton. In the basic embodiment the blank comprises a central section and two side sections with cutout flaps adapted to be folded to a position spanning the central section. The basic blank may be modified to include two wing portions attached to the side sections each having flap portions, said wing portions adapted to be folded to a position in planar contiguity with said side sections and said flap portions adapted to be folded outwardly away from said side sections. A plurality of either of such blanks may be integrally attached to form a single blank for folding into a partition unit of any desired number of cells.

3,626,495

TANGLE FREE WIRE HOLDER

John A. Bastian, Jr., 3920 Haring Road, Metairie, La.

Filed Mar. 5, 1970, Ser. No. 16,691
Int. Cl. B65h *75/06*
U.S. Cl. 242—85.1 **1 Claim**



A device for storing extension wires used with electrical appliances. This device is boardlike in configuration and eliminates tangles in the wire which normally causes damage to the wire. The device consists of a boardlike affair having V-slotted openings at each end to accommodate the wire, one edge of the device having a pair of spaced-apart and keyhole shape configurated openings for the insertion of the wire at the end of the male and female plugs of the wire, the opposite edge having an elongated opening which serves as a handle for the board.

3,626,496

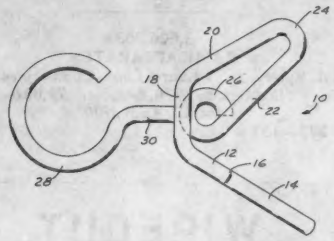
THREAD GUIDE

Albert D. Harmon, Clemson, S.C., assignor to Maremont Corporation, Chicago, Ill.

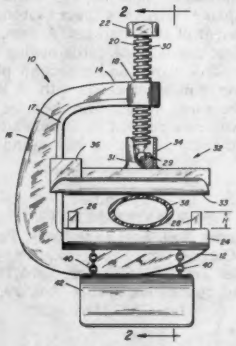
Filed Oct. 12, 1970, Ser. No. 79,736
Int. Cl. B65h *57/08*
U.S. Cl. 242—157 R **6 Claims**

An upswingable, self-threading yarn guide is disclosed, having two legs extending from a single shank to form a bifurcate yarn-gathering structure, one leg intermediate its

juncture with the shank being bent downwardly and outwardly as a yarn-gathering guide, and the other leg intermediate its juncture with the shank being bent downwardly and inwardly thereof and terminating in a helical turn away from said first leg so as to receive yarn gathered by said first leg in a yarn-retaining and self-threading function. Also disclosed is a conventional circular holder attached to the shank opposite the legs for attachment to an upswingable yarn guide-holding fixture attached to a textile spinning or twisting machine.



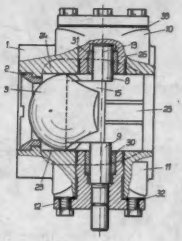
3,626,497
PLASTIC PIPE CLAMP
Lucian T. Lambert, 6004 East 18th St., Tulsa, Okla., and Edward K. Knouse, Jr., 5729 East 26th Pl., Tulsa, Okla.
Filed Aug. 6, 1969, Ser. No. 847,957
Int. Cl. F16k 7/06
U.S. Cl. 251—8 2 Claims



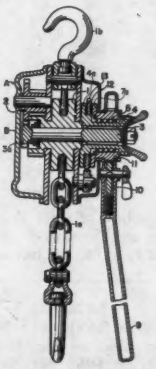
A clamp for shutting off flow through heavy wall plastic pipe utilizes a stationary jaw and a vertically movable jaw carried on a frame. Downward movement of the movable jaw towards the stationary jaw pinches the walls of the pipe placed therebetween without rupture of the pipe. Adapters provide application of the clamp to pipes having diverse outer diameters.

3,626,498
VALVE
Herbert Rihm, Ostheim, Germany, assignor to Honeywell G.m.b.H., Frankfurt-am-Main, Germany
Filed Nov. 6, 1969, Ser. No. 874,590
Claims priority, application Germany, Nov. 14, 1968, P 18 08 764.4
Int. Cl. F16k 31/44
U.S. Cl. 251—261 9 Claims

A valve having a sleeve-shaped body, a plug that has a hemispherical shaped portion that is movable in an axial direction within the inner wall of the sleeve with respect to an annular valve seat formed in the body, and an eccenter connected to a rotatable shaft and in engagement with a substantially C-shaped wall portion of the plug to simultaneously, slidably and rotatably move the hemispherical plug portion into and out of engagement with the valve sleeve during associated clockwise and counterclockwise movements of the shaft.



3,626,499
SMALL-SIZED HOIST DEVICE
Hideo Iwama, Tokyo, and Takeshi Saito, Kawasaki-shi, both of Japan, assignors to Kabushiki Kaisha Kito Seisakusho, Kawasaki-shi, Kanagawa-ken, Japan
Filed Feb. 19, 1969, Ser. No. 800,662
Claims priority, application Japan, Feb. 21, 1968, 43/12829
Int. Cl. B66d 1/04
U.S. Cl. 254—167 10 Claims

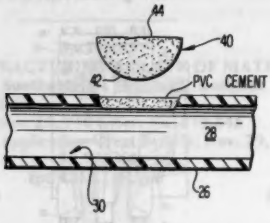


In a small-sized hoist device, an inner annular member disposed in spaced relationship to an outer annular member is employed in transmitting the input force to the drive shaft. The inner annular member is mounted and rotates with the shaft while the input force is delivered to the outer annular member which conveys the force through interlocking means to the inner member. The interlocking means comprises a cage member holding a plurality of balls which fit into continuous threads formed in the oppositely arranged facing surfaces of the inner and outer annular members.

3,626,500
AERATION SYSTEM AND METHOD OF FABRICATION
Carl Dummann, 3959 Spenard Road, Anchorage, Alaska
Filed July 17, 1970, Ser. No. 55,708
Int. Cl. B01f 3/04
U.S. Cl. 261—121 R 8 Claims

An aeration system wherein a plastic pipe is provided with porous ceramic inserts to release a controlled volume of gas from the pipe. The pipe also has a series of porous ceramic dewatering discs for drainage of liquid from the pipe; and A method of installing porous ceramic elements in a pipe wherein slots are formed in the pipe and dimensioned to

tightly grip the elements. The slots are coated with a liquid cement to provide lubrication for insertion of the discs, and

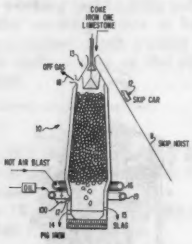


additional mastic is thereafter injected under pressure to form an adhesive bond between the elements and the pipe.

3,626,501
APPARATUS FOR INJECTING FLUID FUEL INTO A BLAST FURNACE

Roger B. Baird, Palos Park; Frank J. Bruns, Homewood, and Barney Vallino, Jr., Chicago Heights, all of Ill., assignors to Atlantic Richfield Company

Original application Mar. 18, 1968, Ser. No. 714,112, now Patent No. 3,523,683, which is a continuation of application Ser. No. 415,373, Dec. 2, 1964, now abandoned. Divided and this application Dec. 11, 1969, Ser. No. 889,791
Int. Cl. C21b 7/16
U.S. Cl. 266—41 **12 Claims**

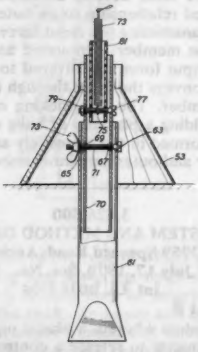


System for the injection of fluid hydrocarbon fuels into a bast furnace through an injection lance mounted in a tuyere for injecting the fluid fuel into the hot airblast of the tuyere.

3,626,502
TETHERED BALL FOR BASEBALL BATTING PRACTICE

Ben A. Well, Houston, Tex., assignor to Indian Head, Inc.

Filed July 24, 1968, Ser. No. 747,390
Int. Cl. A63b 69/40
U.S. Cl. 273—26 E **1 Claim**

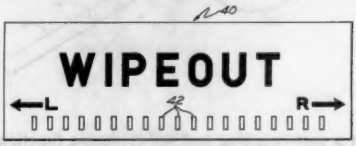


A batting practice apparatus including a ball secured to a cord light enough and long enough to have little effect on the pitching and batting of the ball, the cord being secured to an upright stake arrangement for absorbing the shock of the ball and keeping the ball in a confined area. The stake arrangement principally includes a vertically mounted spring surrounded by a flexible collar and an inverted funnel-shaped enclosure to prevent the cord from becoming fouled on the stake.

3,626,503
GAME APPARATUS

Wilfred H. Rattey, Jr., 1 Laurel Lane, Cumberland, R.I.

Filed Oct. 8, 1970, Ser. No. 79,026
Int. Cl. A63f 3/00
U.S. Cl. 273—135 R **3 Claims**

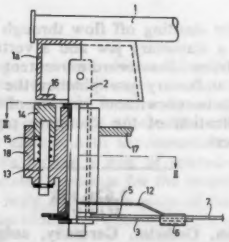


A game apparatus having a plurality of identical playing boards, each having a plurality of rectangles marked thereon and being arranged in a line with the longer dimension of the rectangles being substantially perpendicular to the line. On one side of the board an arrow points to the left with the letter L next to it and on the other side an arrow points to the right with the letter R next to it. Each board has its own set of markers with each marker of the set having a different numeral on it. The markers have a substantially rectangularly shaped base generally conforming to the dimensions of the rectangles marked on said playing boards, with the height of said markers being greater than the longer dimension of said base. The number of markers in each set equals the number of rectangles marked on said playing boards. The rectangles marked on the game boards are spaced laterally by a distance less than the height of said markers. A deck of cards is used comprising a first plurality of cards having no numerals on them known as free cards and a second plurality of cards comprising several pairs of cards with at least one pair of cards having the same numeral on them as that on each of said markers with one card of each pair having the letter L on it and the other card of the set having the letter R on it.

3,626,504
RECORD PLAYER

Martinus Johannes Holl, La Lande Patry, France, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 29, 1970, Ser. No. 6,785
Claims priority, application France, Jan. 29, 1970, 6901746
Int. Cl. G11b 17/00
U.S. Cl. 274—1 L **6 Claims**



A record player suitable for playing records having the standard diameters of 30, 25 and 17 cm. and records having diameters smaller than 13 cm., in particular a diameter of 10 cm. The record player of the invention has an automatic switch-off mechanism of the type comprising a displaceable trip lever which, when a record is being played, is moved by the moving tone arm into the path of a projection which is eccentrically provided on the turntable. The trip lever is periodically moved back by this projection, but when the pickup needle moves into the runout groove of a record it is displaced a larger distance by a control element so that the

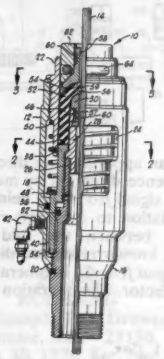
projection grips the lever to impart an additional displacement to it, which causes automatic switch-off. The record player includes an abutment pin which, in order to enable records having diameters smaller than 13 cm. to be played, can be so operated by the person using the record player that, when the tone arm is set on the record, the control element is temporarily blocked so that contact with the trip lever is postponed in order to prevent premature switching off.

3,626,505

WIRE LINE STRIPPER

Bobby L. Douglas, Ennis, Tex., assignor to Dresser Industries, Inc., Dallas, Tex.

Filed Aug. 28, 1969, Ser. No. 853,888
Int. Cl. F16j *9/00, 15/54*
U.S. Cl. 277—2 **3 Claims**



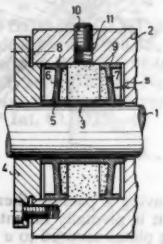
A wire line stripper for use in conjunction with the movement of wire line supported tools into and out of well bores. The stripper includes a housing encircling the wire line, a sealing element located in the housing and having a surface thereon in engagement with the wire line. The sealing element is constructed so that the pressure responsive means continues to maintain the seal member in sealing engagement with the wire line even though considerable wear occurs on the seal surface that is in engagement with the wire line.

3,626,506

REMOVABLE SECURING DEVICE

Rudolf Spieth, Kennenburgerstrasse 42, 73 Esslingen-Kennenburg, Germany

Filed Dec. 11, 1968, Ser. No. 782,924
Claims priority, application Germany, Dec. 15, 1967, P 16 25 452.7
Int. Cl. F16d *1/06*
U.S. Cl. 287—52 **6 Claims**



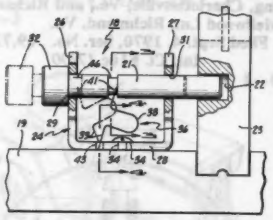
A clamping bushing for removably securing two elements on each other, for example, a pulley on a shaft, so as to be exactly coaxial. The device consists of a tubular part which is slipped, for example, loosely over the shaft and has a pair of substantially radial flanges which extend at an angle of more or less than a right angle to the tubular part and have small coaxial tubular extensions on their outer ends which are fitted tightly, for example, into a cylindrical bore in a pulley. When a pressure is applied upon a pressure fluid in the chamber formed between the flanges, the tubular part and the wall of the bore, the flanges are bent to a more erect position and thereby increase in effective length so as to connect the two elements tightly to each other.

3,626,507

PATIO DOOR LOCK

Donald B. Hawkins, 2233 A Washington Ave., San Leandro, Calif.

Filed Oct. 24, 1969, Ser. No. 869,036
Int. Cl. E05c *1/00, 13/02*
U.S. Cl. 292—175 **3 Claims**



A device for locking sliding patio doors and other sliding sashes characterized by an extremely simple construction featuring an overcenter spring-induced toggle action imparted to a lock bolt to selectively urge same into locked position or hold same in open or unlocked position. The spring functions as a keeper for retaining the bolt in locked position and as a stop for determining the unlocked position of the bolt.

3,626,508

CONCRETE PIPE LIFTING CONNECTOR

Clarence C. Sharrow, 121-11th Ave. South, South St. Paul, Minn.

Filed Sept. 11, 1970, Ser. No. 71,296
Int. Cl. F16g *11/00*
U.S. Cl. 294—89 **4 Claims**

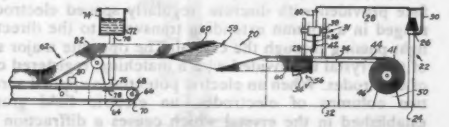
A quick attach and release connector for lifting heavy objects such as sewer pipes in which a slotted plate slides over a steel cable and is retained in place by a sleeve on the cable which is prevented from leaving the slot in the plate by a retaining rim on the plate.

3,626,509

DISPOSABLE MOP ASSEMBLY AND METHOD OF FORMING DISPOSABLE MOPHEAD THEREFOR

James M. Rones, P.O. Box 13377, Atlanta, Ga.

Filed Oct. 8, 1969, Ser. No. 870,491
Int. Cl. A46d *1/08*
U.S. Cl. 300—21 **2 Claims**



A web of canvas backing mate al is continuously unreeled for tufting with yarn whose ends are sheared to form the mop

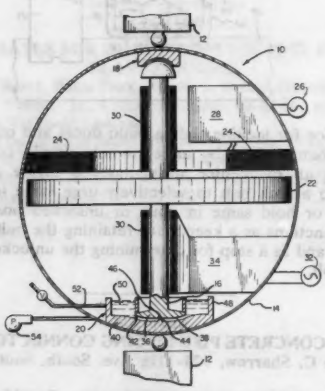
strands with the canvas backing receiving a thick vinyl layer which is cured thereto prior to transversely severing of the finished web laminate to form individual disposable mophead. A thin metal plate removably coupled to the mophead carries a simplified universal joint which connects the same to the mop handle.

3,626,510

HYDRAULIC BEARING SYSTEM

James J. Kauzlarich, University of Virginia School of Engineering and Applied Science Department of Mechanical Engineering, Charlottesville, Va., and Richard D. Rheutan, Jr., 206 Mellwood Ln., Richmond, Va.

Filed Sept. 4, 1970, Ser. No. 69,727
Int. Cl. F16c 17/00
U.S. Cl. 308—1 7 Claims



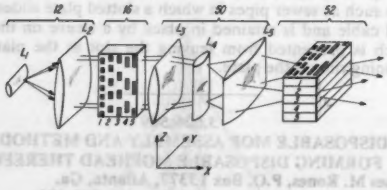
A hydraulic thrust bearing having bearing members with horizontally aligned, spaced bearing surfaces and a liquid completely filling the space between the surfaces. One member is oscillated normal to the bearing surfaces to generate a positive load supporting force in the bearing.

3,626,511

DIGITAL LIGHT DEFLECTOR USING ELECTRO-OPTIC GRATING

Jacob Meyer Hammer, Trenton, N.J., assignor to RCA Corporation

Filed July 20, 1970, Ser. No. 56,496
Int. Cl. G02f 1/26
U.S. Cl. 350—160 10 Claims



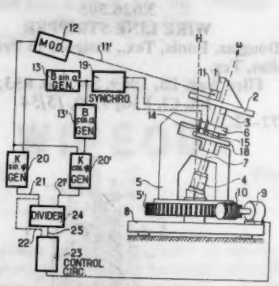
A digital light deflector or modulator is disclosed in which a polarized sheet of light derived from a laser is directed through a slab of an electro-optic crystal such as lithium niobate, $LiNbO_3$. The crystal slab is thin and has a major surface provided with discrete, regularly spaced electrodes arranged in a column extending transverse to the direction of light passing through the crystal. The opposite major surface of the crystal is provided with a matching, registered column of electrodes. When an electric potential is applied across the two columns of electrodes, an electric field grating is established in the crystal which causes a diffraction of the sheet of light in a direction lying in the plane of the sheet of light. The output sheet of light from the crystal may be translated to a beam of light by lenses.

3,626,512

PROCESS AND APPARATUS FOR DETERMINING A REFERENCE DIRECTION

Jean Michel Catherin, Savigny-sur-Orge, France, assignor to Compagnie Generale D'Electricite, Paris, France

Filed May 7, 1969, Ser. No. 822,587
Claims priority, application France, May 7, 1968, 150778
Int. Cl. G01b 11/26
U.S. Cl. 356—141 7 Claims



A process and an apparatus are disclosed for determining an unknown reference direction by means of a rotating unit which transmits a signal $f(\alpha-\Phi)$,α being the angular position of the unit in relation to a known reference direction, Φ being the angle between the said unknown reference direction and the known reference direction. A signal $f(\alpha)$ identical to the signal $f(\alpha-\Phi)$ is generated to the nearest constant multiplying factor. The operation

$$\frac{1}{T}\int_0^{\alpha T} f(\alpha-\rho)\,f(\alpha)\,d(\alpha)$$

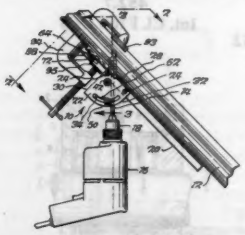
is performed by electronic means, T being the rotation period of the said unit, the value of the resulting signal being g, which is the characteristic of the angle defining the position of the unknown reference direction in relation to the known reference direction.

3,626,513

TOOL GUIDE

Sylweriusz Pytlak, 50 Robin Court, West Seneca, N.Y.

Filed Jan. 15, 1970, Ser. No. 3,058
Int. Cl. B23b 47/28
U.S. Cl. 408—115 7 Claims



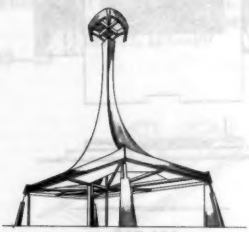
A guide body having a passage therethrough for accommodating a tool bit is pivotally mounted between a pair of spaced, upstanding plates secured to a base member. A stop member adjustably threaded into the passage controls the depth of penetration of the tool bit. Lateral projections extend from opposite sides of the guide body through arcuate slots in the plates for receiving fasteners to secure the guide body in a selected angular position relative to the base member. In another form, a pair of rods pivotally mounted adjacent the base member extend through lugs projecting laterally outwardly from opposite sides of the guide body and set screws in the lugs engage the rods for securing the guide body in a selected angular orientation.

DESIGNS

DECEMBER 7, 1971

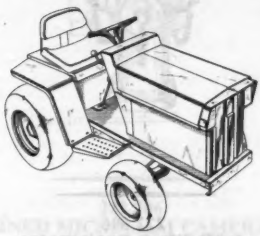
222,689
WEEDING TOOL
Kaneo Futami, 319 N. Vancouver Ave., Los Angeles, Calif. 90022
Filed July 7, 1969, Ser. No. 18,084
Term of patent 7 years
Int. Cl. D8—*01*
U.S. Cl. D8—4

222,690
BUILDING
Scott W. Rumph, P.O. Drawer 1060, Sumter, S.C. 29150
Filed Aug. 19, 1970, Ser. No. 24,570
Term of patent 14 years
Int. Cl. D25—*04*
U.S. Cl. D13—1



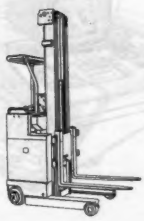
222,691
WOOD MOULDING
Skuli Walter Lindal, 9004 S. 19th St., Tacoma, Wash. 98466
Filed Mar. 16, 1970, Ser. No. 21,908
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D13—6

222,692
TRACTOR
John C. Pritchett, Schenectady, Bruce R. Laumeister, Rexford, and Raymond M. Fisher, Jr., Schenectady, N.Y., assignors to General Electric Company
Filed Feb. 2, 1970, Ser. No. 21,188
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



222,693
CHAIR
Wayland B. Parker, Merritt Hill, Va., assignor to Daystrom Virtue, Inc., Houston, Tex.
Continuation of abandoned applications Ser. No. 16,637 and Ser. No. 16,645, both Apr. 9, 1969. This application Oct. 7, 1969, Ser. No. 19,784
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D15—1

222,694
INDUSTRIAL FORK LIFT TRUCK
Cecil Goodacre, Basingstoke, England, assignor to Lansing Bagnall Limited, Hampshire, England
Filed Nov. 3, 1970, Ser. No. 25,798
Term of patent 14 years
Int. Cl. D12—*09*
U.S. Cl. D14—3



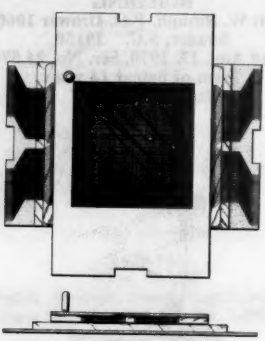
222,695
FIRE HYDRANT
John J. Smith, Decatur, Ill., assignor to Mueller Co., Decatur, Ill.
Filed May 11, 1970, Ser. No. 22,904
Term of patent 14 years
The portion of the term of the patent subsequent to Aug. 18, 1984, has been disclaimed
Int. Cl. D23—*01*
U.S. Cl. D23—12

222,696
DRINKING FOUNTAIN
Cornelius Sampson, 1080 Grizzly Peak Blvd., Berkeley, Calif. 94708
Filed June 22, 1970, Ser. No. 23,605
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—13

222,697
PORTABLE ELECTRONIC CALCULATOR
Takashi Morita, Sagamihara-shi, Japan, assignor to Takachiho Koeki Kabushiki Kaisha, Osaka-shi, Japan
Filed Dec. 4, 1969, Ser. No. 20,350
Claims priority, application Japan June 9, 1969
Term of patent 14 years
Int. Cl. D14—*02;* D18—*01*
U.S. Cl. D26—5

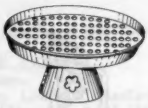
222,698
HOUSING FOR KEYBOARD DISPLAY TERMINAL
Douglas G. Ohlmann, West Newton, Mass., assignor to Infoton, Incorporated, Burlington, Mass.
Filed Mar. 10, 1970, Ser. No. 21,839
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D26—5

222,699
LIGHT EMITTING GAS DISCHARGE MATRIX DISPLAY PANEL
Gerald E. Wojcik, 4619 282nd St., Toledo, Ohio 43611
Filed Aug. 7, 1970, Ser. No. 24,380
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D26—5



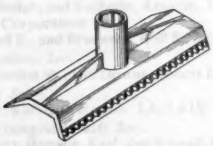
222,700
COPYING MACHINE FOR MAGNETIC VIDEO TAPE
Yoji Ishida, Ashiva, Ryohei Nishimoto, Osaka, and Kenichi Murakami, Suite, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed May 6, 1970, Ser. No. 22,863
Claims priority, application Japan Nov. 8, 1969
Term of patent 14 years
Int. Cl. D14—*01, 02*
U.S. Cl. D26—14

222,701
FOOD SUPPORT FOR A COOKING VESSEL
Joyce Chen, 47 Alpine St., Cambridge, Mass. 02138
Filed Mar. 9, 1970, Ser. No. 21,796
Term of patent 14 years
Int. Cl. D7—*02*
U.S. Cl. D44—1



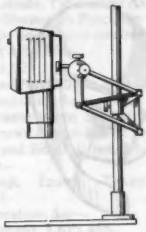
222,702
VACUUM CLEANER BRUSH ROLL
Harold W. Schaefer, Bloomington, and William H. Penn, Normal, Ill., assignors to National Union Electric Corporation, Stamford, Conn.
Filed July 23, 1970, Ser. No. 24,086
Term of patent 14 years
Int. Cl. D4—*01*
U.S. Cl. D49—17

222,703
COMBINATION SQUEEGEE AND SCRAPER HEAD OR SIMILAR ARTICLE
William P. Richardson, Greenwich, Conn., assignor to Empire Brushes, Inc., Port Chester, N.Y.
Filed Jan. 17, 1969, Ser. No. 15,393
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D49—23

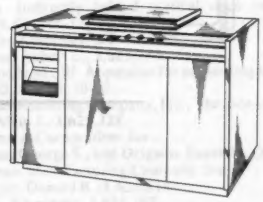


222,704
ICE CUBE VENDING MACHINE
Marion H. Winsett, 3920 Mandell, Houston, Tex. 77006
Filed Jan. 23, 1970, Ser. No. 21,060
Term of patent 14 years
Int. Cl. D20—*01*
U.S. Cl. D52—3

222,705
OPAQUE IMAGE PROJECTOR OR THE LIKE
Gerald G. Mayer, Los Angeles, Calif., assignor to Kopykake Enterprises
Filed Apr. 2, 1970, Ser. No. 22,212
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



222,706
COMBINED MICROFILM CAMERA AND PROCESSING MACHINE
Hiroshi Saito, Shuzo Horikoshi, and Iwao Nakajima, Osaka, and Susumu Yamamoto, Moriguchi, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed June 25, 1970, Ser. No. 23,656
Claims priority, application Japan Dec. 29, 1969
Term of patent 14 years
Int. Cl. D16—*02*
U.S. Cl. D61—1



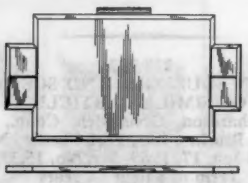
222,707
TYPEWRITER
Matsakatsu Yotsukura, Narashino-shi, Japan, assignor to Citizen Watch Co., Ltd., Tokyo, Japan
Filed Aug. 21, 1970, Ser. No. 24,635
Claims priority, application Japan May 30, 1970
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11

222,708
HAND PADDLE FOR AQUATIC USE
Albert Balla, Hollywood, Fla.
((3494 N. Ocean Blvd., Fort Lauderdale, Fla. 33308)
Filed June 10, 1970, Ser. No. 23,421
Term of patent 14 years
Int. Cl. D21—*03*
U.S. Cl. D71—1

222,709
SKI PANTS HANGER
David L. Conger, 1508 Tennessee St., Vallejo, Calif. 94590
Filed Nov. 24, 1969, Ser. No. 20,266
Term of patent 14 years
Int. Cl. D6—*07*
U.S. Cl. D80—8

222,710
BICYCLE MIRROR
Emil Kirwin, Holywood, Fla., and Jack Kramer, Bronx, N.Y., assignors to D. P. Harris Hardware & Manufacturing Co., Inc., New York, N.Y.
Filed Nov. 23, 1970, Ser. No. 26,114
Term of patent 14 years
Int. Cl. D12—*16*
U.S. Cl. D90—1

222,711
BULLETIN BOARD
Melburn O. Simmons, 675 Duane St., Glen Ellyn, Ill. 60137
Filed Dec. 2, 1969, Ser. No. 20,331
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 7TH DAY OF DECEMBER, 1971

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

AB Tetra Pak: *See—*
Holmstrom, Sven Nils Hakan; and Olsen, Jan-Erik, 3,625,785.

AB Vibrasug: *See—*
Folke, Carl Tage E., 3,624,859.

Abbott Laboratories: *See—*
Pearson, Whitney Lombard; Banford, John Alexander; and Szymanski, Earl Thaddeus, 3,625,786.

Abell, Gurdon R.; and Gillespie, Charles E., to Avco Corporation. Apparatus for remote sensing and analyzing of gaseous materials using Raman radiation. 3,625,613, Cl. 356-75.

Abend, Harvey: *See—*
Mackey, E Scudder; and Abend, Harvey,3,625,695.

Aberer, Leo F.: *See—*
Scott, Robert J.; and Aberer, Leo F.,3,625,555.

Abex Corporation: *See—*
Green, Robert H., 3,626,342.

Abitibi St. Anne Paper Ltd.: *See—*
Kempe, Carl, 3,625,268.
Ranzenhofer, Raoul, 3,625,531.

Abramo, Samuel V.: *See—*
Viel, Charles F., III, 3,625,482.

Abramowitz, Mark H.; and Shapiro, Harry G., to Lee Electric Inc. Illuminable push-button switch. 3,626,171, Cl. 240-2.

Abrams, Raymond M.; and Beranbaum, Elliott R. Apparatus to facilitate sealing of arterial punctures. 3,625,219, Cl. 128-325.

Accettura, Frank: *See—*
Mac Kenzie, Douglas J.; Accettura, Frank; and Hansen, Peter F.,3,625,775.

ACF Industries, Incorporated: *See—*
Kinnecom, Paul G., 3,626,484.

Acme Visible Records, Inc.: *See—*
Toms, Lloyd M., 3,625,368.

Acme-Cleveland Corporation: *See—*
Bourassa, Hugh A.; Emser, Arthur H.; and Ptak, Edward J., 3,625,078.

Adachi, Yoshinobu: *See—*
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Brass, Michele; and Brass, Ennio. Devices for the rational washing of tooth root canal with simultaneous suction of the outflowing liquid and related improved devices. 3,624,907, Cl. 32-40.

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Roberts, John A.; and Roberts, Peter R., to Brunswick Corporation. Superconductor. 3,625,662, Cl. 29-191.6

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Rutz, Hans; and Gubler, Kurt, to Geigy Chemical Corporation. Aliphatically substituted thio-sulfinyl-and sulfonyl-alkyl-2,4,5-trihalogeno-imidazoles. 3,625,955, Cl. 260-309.
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Schaefer, David P.; and Kovarik, James F., to Nalco Chemical Company. Method of producing organosols. 3,625,856, Cl. 252-309.

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Scharf, Herbert D. Roller clutch assembly. 3,625,324, Cl. 192-45.

Schatter, Eckart; and Renk, Hans Ulrich, deceased0 (by Renk, Johanna Elisabeth, nee Jahnel0Bergmann, Sibylle Freia, nee Renk0Renk, Ingo Wolfram, heirs), to Siemens Aktiengesellschaft. Circuit arrangement for automatic electronic frequency trimming in a receiver. 3,626,215, Cl. 307-295.

Scheben, John A.; Fisher, Joseph M.; and Mador, Irving L., to National Distillers and Chemical Corporation. Preparation of unsaturated acyl halides. 3,626,005, Cl. 260-544.

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Siefermann, Willi, deceased0 (by Siefermann, Luise, nee Gaugler0Siefermann, Dorothea0Siefermann, Hans; heirs). Mobile swivel ladder. 3,625,307, Cl. 182-66.

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Zanzarella, Anthony; and Gag, Joseph B., to Textron, Inc. Motor generator with automatic speed and idling control. 3,626,197, Cl. 290-40.

Zecher, Wilfried; and Merten, Rudolf, to Farbenfabriken Bayer Aktiengesellschaft. Process for the production of aldimino- and ketimino-nitroaryl ethers. 3,626,009, Cl. 260-566.

Zeigler, Robert O.: *See—*
Schirm, Helmut T.; and Zeigler, Robert O.,3,625,671.

Zeiss, Carl: *See—*
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Zenith Radio Corporation: *See—*
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Zickos, William. Drums. 3,626,458, Cl. 84-411.

Zielke, Clyde W.: *See—*
Gorin, Everett; Struck, Robert T.; and Zielke, Clyde W.,3,625,861.

Zinsco Electrical Products: *See—*
Sturdivan, Rex E., 3,626,253.

Zschaeck, Herbert K.; and Rothinger, Karl, to Kontex Kontrolltechnik, Firma. Coin sorting device. 3,625,230, Cl. 133-3.

Zschocke, Albrecht; Koenig, Karl-Heinz; and Steinbrunn, Gustav, to Badische Anilin- & Soda-Fabrik Akteingesellschaft. Production of tetrahydro-1,2,4-oxadiazine-3,5-diones. 3,625,968, Cl. 260-244.

Zuck, Robert N.: *See—*
Miller, Kenneth H.; and Zuck, Robert N.,3,625,576.

Zuk, Paul, to Bell Telephone Laboratories, Incorporated. Class AB amplifier for monolithic integrated circuit. 3,626,313, Cl. 330-40.

Zurwelle, Rolf A.: *See—*
Governale, Anthony J.; and Zurwelle, Rolf A.,3,626,152.

Zweig, Hans J.: *See—*
Brown, Byron R.; Sanders, Kenneth; Shew, Lester F.; and Zweig, Hans J.,3,625,598.

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NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Balla, Albert. Hand paddle for aquatic use. 222,708, 12–7–71, Cl. D71—1

Chen, Joyce. Food support for a cooking vessel. 222,701, 12–7–71, Cl. D44—1.

Citizen Watch Co., Ltd.: *See*—
Yotsukura, Masakatsu. 222,707.

Conger, David L. Ski pants hanger. 222,709, 12–7–71, Cl. D80—8.

Daystrom Virtue, Inc.: *See*—
Parker, Wayland B. 222,693.

Empire Brushes, Inc.: *See*—
Richardson, William P. 222,703.

Fisher, Raymond M., Jr.: *See*—
Pritchett, John C., Laumeister, and Fisher. 222,692.

Futami, Kaneo. Weeding tool. 222,689, 12–7–71, Cl. D8—4.

General Electric Co.: *See*—
Pritchett, John C., Laumeister, and Fisher. 222,692.

Harris, D. P., Hardware & Mfg. Co., Inc.: *See*—
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Ishida, Yoji, R. Nishimoto, and K. Murakami, to Matsushita Electric Industrial Co., Ltd. Copying machine for magnetic video tape. 222,700, 12–7–71, Cl. D26—14.

Kirwin, Emil, and J. Kramer, to D. P. Harris Hardware & Mfg. Co., Inc. Bicycle mirror. 222,710, 12–7–71, Cl. D90—1.

Kopykake Enterprises: *See*—
Mayer, Gerald G. 222,705.

Kramer, Jack: *See*—
Kirwin, Emil, and Kramer. 222,710.

Goodacre, Cecil, to Lansing Bagnall Ltd. Industrial fork lift truck. 222,694, 12–7–71, Cl. D14—3.

Lansing Bagnall Ltd.: *See*—
Goodacre, Cecil. 222,694.

Laumeister, Bruce R.: *See*—
Pritchett, John C., Laumeister, and Fisher. 222,692.

Lindal, Skuli W. Wood moulding. 222,691, 12–7–71, Cl. D13—6.

Matsushita Electric Industrial Co., Ltd.: *See*—
Ishida, Yoji, Nishimoto, and Murakami. 222,700.
Saito, Hiroshi, Horikoshi, Nakajima, and Yamamoto. 222,706.

Mayer, Gerald G., to Kopykake Enterprises. Opaque image projector or the like. 222,705, 12–7–71, Cl. D61—1.

Morita, Takashi, to Takachiho Koeki Kabushiki Kaisha. Portable electronic calculator. 222,697, 12–7–71, Cl. D26—5.

Mueller Co.: *See*—
Smith, John J. 222,695.

Sampson, Cornelius. Drinking fountain. 222,696, 12–7–71, Cl. D23—13.

Murakami, Kenichi: *See*—
Ishida, Yoji, Nishimoto, and Murakami. 222,700.

Nakajima, Iwao: *See*—
Saito, Hiroshi, Horikoshi, Nakajima, and Yamamoto. 222,706.

National Union Electric Corp.: *See*—
Schaefer, Harold W., and Penn. 222,702.

Nishimoto, Ryohei: *See*—
Ishida, Yoji, Nishimoto, and Murakami. 222,700.

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Parker, Wayland B., to Daystrom Virtue, Inc. Chair. 222,693, 12–7–71, Cl. D15—1.

Penn, William H.: *See*—
Schaefer, Harold W., and Penn. 222,702.

Pritchett, John C., B. R. Laumeister, and R. M. Fisher, Jr., to General Electric Co. Tractor. 222,692, 12–7–71, Cl. D14—3.

Richardson, William P., to Empire Brushes, Inc. Combination squeegee and scraper head or similar article. 222,703, 12–7–71, Cl. D49—23.

Rumph, Scott W. Building. 222,690, 12–7–71, Cl. D13—1.

Saito, Hiroshi, S. Horikoshi, I. Nakajima, and S. Yamamoto, to Matsushita Electric Industrial Co., Ltd. Combined microfilm camera and processing machine. 222,706, 12–7–71, Cl. D61—1.

Schaefer, Harold W., and W. H. Penn., to National Union Electric Corp. Vacuum cleaner brush roll. 222,702, 12–7–71, Cl. D49—17.

Simmons, Melburn O. Bulletin board. 222,711, 12–7–71, Cl. D96—12.

Smith, John J., to Mueller Co. Fire hydrant. 222,695, 12–7–71, Cl. D23—12.

Takachiho Koeki Kabushiki Kaisha: *See*—
Morita, Takashi. 222,697.

Winsett, Marion H. Ice cube vending machine. 222,704, 12–7–71, Cl. D52—3.

Wojcik, Gerald E. Light emitting gas discharge matrix display panel. 222,699, 12–7–71, Cl. D26—5.

Yamamoto, Susumu: *See*—
Saito, Hiroshi, Horikoshi, Nakajima, and Yamamoto. 222,706.

Yotsukura, Masakatsu, to Citizen Watch Co., Ltd. Typewriter. 222,707, 12–7–71, Cl. D64—11.

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CLASSIFICATION OF PATENTS

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